Subject: Langley Research Center Occupational Health Program

Responsible Office: Safety & Mission Assurance Office

Chapters are linked in the table below. Click each chapter title to access the linked chapter.

Chapter	Title	Expiration Date
1	Automated External Defibrillator Program	March 31, 2026
2	Smoking Control Program	March 31, 2026
3	Bloodborne Pathogens Program	March 31, 2026
4	Respiratory Protection Program	March 31, 2026
5	Personal Protective Equipment (PPE)	March 31, 2026
6	Noise Control and Hearing Conservation Program	March 31, 2026
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Subject: Automated External Defibrillator Program

Responsible Office: Safety & Mission Assurance Office

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Baseline	March 24, 2021	New document

PREFACE

P.1 PURPOSE

a. The purpose of the Automated External Defibrillator (AED) Program is to provide timely response to victims of sudden cardiac arrest caused by ventricular fibrillation. Coronary heart disease is the leading cause of death in the United States.

b. Sudden cardiac death due to ventricular fibrillation is a treatable condition and potentially survivable when defibrillation is applied within the first minutes.

c. Early recognition and application of an AED and properly performed cardiopulmonary resuscitation (CPR) by trained lay rescuers can improve the outcome from cardiac arrest.

P.2 APPLICABILITY

a. This Langley Procedural Requirement (LPR) is applicable to all NASA Langley Research Center (LaRC) organizations and all federal civil service personnel on Center.

b. This LPR is applicable to contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, agreements, or grants.

c. Noncompliance with the requirements of this LPR may result in appropriate disciplinary action against civil service personnel or sanctions against contractors in accordance with the terms of their contracts.

a. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term “shall.” The terms “may” denotes a discretionary privilege or permission, “can” denotes statements of possibility or capability, “should” denotes a good practice and is recommended, but not required, “will” denotes expected outcome, and “are/is” denotes descriptive material.

d. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

a. Public Health Improvement Act, Title IV – Cardiac Arrest Survival, Pub. L. 106-505, 114 Stat. 2314 (2000).

P.4 APPLICABLE DOCUMENTS AND FORMS

a. NPR 1800.1, NASA Occupational Health Program Procedures.

b. NPD 1800.2, NASA Occupational Health Program.

c. LAPD 1150.2, Councils, Boards, Panels, Committees, Teams, and Groups.

d. LAPD 1440.7, Langley Research Center (LaRC) Records Management.

e. LMS-CP-7151, Obtaining Waivers for Langley Management System (LMS) Requirements.

f. LF 483, Monthly Automated External Defibrillator (AED) Safety Maintenance Inspection Record (for Med Tronic and Philips AEDs).

P.5 MEASUREMENTS/VERIFICATION

None

P.6 CANCELLATION

LPR 1845.1, dated November 14, 2016

/s/ David F. Young March 24, 2021

Center Deputy Director Date

Distribution: Approved for public release via the Langley Management System; distribution is unlimited

CHAPTER 1: AUTOMATED EXTERNAL DEFIBRILLATOR PROGRAM

1.1 INTRODUCTION

1.1.1 This document outlines the requirements for all personnel participating in the Langley Research Center (LaRC) Automated External Defibrillator (AED) program. All fully trained and certified AED responders are to be authorized and approved by the LaRC Medical Director to operate AEDs. The program does not replace LaRC Emergency Medical Services.

1.2 WAIVERS

1.2.1 Requests for waivers to any of the requirements in this LPR shall be processed in accordance with LMS-CP-7151, “Obtaining Waivers for Langley Management System (LMS) Requirements.”

1.3 RESPONSIBILITIES

1.3.1 AED Responders

1.3.1.1 AED Responders are lay persons who have received training and passed testing requirements of the American Heart Association (AHA) and are qualified to perform cardiopulmonary resuscitation (CPR) and use an AED.

1.3.1.2 AED responders shall:

a. Complete the AHA Heartsaver® CPR AED course and pass testing requirements of the AHA to qualify to perform CPR and use an AED.

b. Participate in a minimum of one of the quarterly practice sessions scheduled throughout the year by the AED Coordinator (AED-C) and approved by the AED Medical Director (AED-MD).

c. Notify the AED-C of current training status and facility location.

d. Notify the AED-C of any equipment problems.

1.3.2 AED Medical Director

1.3.2.1 The AED-MD is the physician responsible for management and implementation of the AED Program.

1.3.2.2 The AED-MD shall:

a. Assist in choosing the appropriate AED for use at the Center. The Food and Drug Administration (FDA) currently requires a physician’s prescription to buy an AED.

b. Maintain guidelines for care protocols and processes for operations of the AED Program.

c. Ensure quality assurance of the AED Program, compliance with protocols, and proper training of AED responders and instructors.

d. Provide positive reinforcement to trained AED responders, as well as corrective instruction.

e. Ensure incident debriefing for AED responders.

f. Support integration of the Center's AED Program into the City of Hampton's Emergency Medical Services (EMS).

g. Report equipment malfunction to the LaRC Occupational Health Officer (OHO), NASA's Office of Safety and Mission Assurance (OSMA), NASA's Office of the Chief Health and Medical Officer (OCHMO), and the FDA Medical Devices Reporting department.

1.3.3 AED Coordinator

1.3.3.1 The AED-C is an individual identified by the AED-MD to oversee the AED Program at LaRC and is responsible for coordinating activities and functioning as the primary liaison between the AED-MD and the program.

1.3.3.2 The AED-C shall:

a. Maintain equipment according to manufacturer's directions.

b. Maintain an inventory of supplies.

c. Maintain and publicize a list of trained responders throughout the Center through various media (e.g., web, facility safety heads, supervisors).

d. Maintain current training records in accordance with LAPD 1440.7.

e. Ensure that appropriate written documentation and incident debriefing sessions for any personnel involved are completed.

f. Promptly bring any AED Program deficiencies identified to the attention of the AED-MD for analysis and resolution.

1.3.4 Basic Life Support (BLS) Instructor

1.3.4.1 BLS instructors are persons certified as AED and CPR instructors by the AHA.

1.3.4.2 BLS instructors shall:

a. Teach a minimum of four classes in a two-year period.

b. Attend quarterly instructor meetings with the AED-C.

c. Assist the AED-C in performing and evaluating practice sessions.

1.3.5 Employee Assistance Program (EAP)

1.3.5.1 The EAP shall offer stress debriefing for AED responders following an incident.

1.3.6 Emergency Medical Services

1.3.6.1 EMS is a team of on-site Emergency Medical Technicians (EMTs) with Advanced Cardiac Life Support (ACLS) training who shall assume responsibility for transporting patients to the nearest emergency room.

1.3.7 AED Control Committee

1.3.7.1 The AED Control Committee, as established in LAPD 1150.2, is a group of NASA civil service and contractor personnel who shall assist the AED-MD with all

aspects of the AED Program.

1.3.7.2 The AED Control Committee shall:

a. Meet at least biannually, after an event involving use of an AED, and upon the request of the AED-MD.

b. Determine appropriate placement of AED units throughout the Center.

c. With the concurrence of the AED-MD, make changes to the requirements of the AED Program based on lessons learned or changes in NPD 1800.2 or NPR 1800.1.

1.3.8 LaRC Supervisors

1.3.8.1 It is highly recommended that LaRC Supervisors incorporate AED awareness briefings annually as part of their monthly safety and/or staff meetings. Awareness should include AED locations, identification of AED responders, emergency numbers, and review of AED protocols. Assistance can be obtained from the AED-C.

1.3.9 Facility Safety Heads

1.3.9.1 LaRC Facility Safety Heads (FSHs) shall know the locations of AEDs in their facilities and check on AEDs and their condition during monthly FSH inspections.

1.3.9.2 If any issues are found, the AED-C shall be contacted immediately.

1.4 TRAINING AND SKILLS COMPETENCY REQUIREMENTS

1.4.1 General Training for LaRC AED Responders

1.4.1.1 AED responders shall complete the AHA Heartsaver® CPR AED course every two years.

1.4.1.2 All AED training equipment shall be specific to the AED equipment used on Center.

1.4.1.3 Quarterly practice sessions with an AED will be offered in accordance with AHA guidelines.

1.4.2 Initial Training for AED Responders

1.4.2.1 Initial training shall be in accordance with AHA standards and include the following:

a. Early activation of the EMS through calling 911 from a LaRC landline or (757) 864-2222 from a cell phone.

b. How to perform rescue breathing using mouth-to-mouth and mouth-to-mask techniques.

c. How to perform one-rescuer CPR on an adult victim.

d. How to relieve adult foreign body airway obstructions in a conscious and unconscious victim.

e. How to provide defibrillation with an AED in less than 90 seconds from placement at the training mannequin’s side.

f. Recognizing the signs and symptoms of four major emergencies: heart attack, cardiac arrest, stroke, and foreign body airway obstruction.

g. Awareness of the links in the AHA chain of survival: Recognition of Cardiac Arrest and Activation of EMS, Early CPR, Rapid Defibrillation, Effective Advanced Life Support, and Integrated Post-Cardiac Arrest Care.

h. Completion of a skills evaluation for CPR techniques and use of the AED.

1.4.3 AED Responder Re-Training

1.4.3.1 Re-training shall be required every two years.

1.4.3.2 Each AED Responder shall attend training sessions to maintain skills.

1.4.3.3 The AED-C shall be responsible for scheduling training and recording participation.

1.4.3.4 Re-training shall consist of the following:

a. Demonstration of AED use during a simulated case of ventricular fibrillation.

b. Demonstration of adult CPR techniques.

c. Awareness of AED inspection procedures using LF 483, “Monthly AED Safety Maintenance Inspection Record.”

d. Satisfactory completion of a skills evaluation.

1.4.3.5 Any AED Responder who fails to attend and successfully demonstrate the above requirements shall no longer be certified as trained to use an AED until the above requirements are met.

1.4.3.6 Remedial training and evaluation results shall be reviewed by the AED-C and AED-MD.

1.4.4 Responders Certified Outside of LaRC

1.4.4.1 Personnel who have not been certified to use an AED by the AED-MD and who have completed requisite training shall be certified by providing the following:

a. Provide proof of successful completion of an AHA certified program.

b. Possesses a current certification (i.e., within the past two years).

c. Satisfactorily perform the skills demonstration requirements stated within this Chapter.

1.5 RESPONSIBILITIES FOLLOWING USE OF AN AED

1.5.1 Introduction

1.5.1.1 When electrodes are applied to a patient and the AED is turned on, it shall constitute “use of the AED.”

1.5.1.2 After any use of the AED, the Safety and Facility Assurance Branch shall ensure the AED is submitted to the LaRC Occupational Health Clinic for transfer of data.

1.5.1.2.1 If the clinic is closed, the AED shall be brought to the clinic on the next business day.

1.5.1.3 A hard copy of the data captured from the AED by either the AED-C or AED-MD shall be submitted to the AED Control Committee.

1.5.1.4 The AED Responder shall notify the AED-MD and the AED-C immediately following use of the AED by calling (757) 864-3192, and provide written documentation (e.g., recording of date and time, notifications, crowd control, escorting of EMS) as soon as possible on the day of the incident, but no later than the beginning of the next business day, to the AED-C, who will determine if an incident debriefing is required.

1.5.1.5 EAP counselors shall be available to Responders in the event of a critical incident.

1.5.1.5.1 Responders shall respect the privacy of others and enforce confidentiality of the incident while advising only those on a need-to-know basis.

1.5.2 Case Review

1.5.2.1 The AED-C shall take the following actions after each emergency incident involving the use of an AED:

a. Verbally notify members of the AED Control Committee of the incident and follow up with written documentation prior to the end of the business day of the incident, but no later than the beginning of the next business day. Such information should include the case outcome.

b. Conduct personnel incident debriefing in accordance with Section 1.6 of this Chapter.

c. Complete an incident follow-up report as deemed necessary by the AED-MD.

d. Restock any consumable items (e.g., electrode pads, batteries, gloves).

e. Inspect unused supplies for any damage or expiration dates.

f. Inspect the AED for dirt and contamination and clean it as needed by following the procedures listed in the user's guide.

1.6 INTERVIEW WITH AED RESPONDERS

1.6.1 After the use of an AED or performing CPR, the AED-C shall contact the EAP office to schedule a stress debriefing for the Responder(s). It is essential to allow AED Responders the opportunity to talk through the event with program professionals and counselors after a crisis. In addition, the NASA mishap investigation team may be used if the incident was caused by an accident.

1.6.2 The AED-C or the AED-MD shall review in person with the primary AED Responder detailed information about the incident as soon as possible.

1.7 DEFECTIVE AED EQUIPMENT

1.7.1 Defects and deficiencies noted in the AED unit shall be followed by:

a. Completing an incident report and forwarding it to the AED-MD.

b. Placing the defective AED out of service until it is inspected and repaired by an authorized service representative.

c. Completing the safety/maintenance inspection record addressing the problem.

d. Presenting the incident report and inspection record to the AED Control Committee.

1.8 MAINTENANCE OF AED EQUIPMENT

1.8.1 The AED-C shall ensure an LF 483 is completed on a monthly basis for all AEDs to ensure the equipment is in proper working condition.

1.8.2 AED Responders throughout the Center shall notify the AED-C immediately if they hear a chirping alarm being emitted from an AED, as this alarm is a warning that the AED has noted a deficiency during a daily internal systems check.

1.8.3 The AED-C shall maintain completed LF 483s.

1.9 PRACTICE SESSIONS

1.9.1 The AED-C shall schedule quarterly practice sessions to allow for hands-on practice using established emergency procedures and to evaluate AED Responders' performance.

1.9.2 All certified responders should attend a minimum of one practice session annually.

1.9.3 The AED-MD shall evaluate practice sessions and implement improvements to emergency processes and protocols.

1.10 ANNUAL QUALITY-ASSURANCE REVIEW

1.10.1 To ensure ongoing quality assurance, the AED-C shall prepare an annual evaluation of the Center AED Program for the AED Control Committee that addresses the effectiveness of the following:

a. AED training program,

b. Quarterly practice sessions and team member feedback,

c. Performance and maintenance of AED equipment,

d. Emergency responses,

e. Identification and implementation of process improvements, and

f. Documentation of outcome measures for treated victims of cardiac arrest.

1.10.2 Interim reports shall be submitted on a quarterly basis to the AED-MD and Occupational Health Officer for review.

1.11 PROTOCOL

1.11.1 The AED Protocol can be found in Appendix C.

1.11.2 Any deviation from this protocol shall be reported to the AED-C.

1.12 RECORDKEEPING

1.12.1 The AED-C shall maintain written records of team member training and practice sessions.

1.12.2 Written documentation shall be maintained for inventories, incident responses, and response outcomes.

1.12.3 All documentation on training, maintenance procedures, and practice sessions shall be maintained in accordance with LAPD 1440.7 and retained for two years.

1.12.4 Documentation of emergency responses shall be retained indefinitely.

APPENDIX A. DEFINITIONS

AED Protocols. Specific procedures to be followed when using an AED, based on manufacturer's instructions and medical guidelines.

Case Reviews. A continuing education program conducted by the AED Medical Director whereby each rescue effort is reviewed and evaluated as part of the LaRC Occupational Health Clinic's medical quality assurance program.

APPENDIX B. ACRONYMS

ACLS	Advanced Cardiac Life Support
AED	Automated External Defibrillator
AED-C	Automated External Defibrillator Coordinator
AED-MD	Automated External Defibrillator Medical Director
AHA	American Heart Association
BLS	Basic Life Support
OHO	Occupational Health Officer
CPR	Cardiopulmonary Resuscitation
EAP	Employee Assistance Program
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
FDA	Food and Drug Administration
LAPD	Langley Policy Directive
LaRC	Langley Research Center
LPR	Langley Procedural Requirement
NPD	NASA Policy Directive
OHP	Occupational Health Program
OSMA	Office of Safety and Mission Assurance

APPENDIX C. AED PROTOCOL

- Check the victim for a response (no longer than 10 seconds)
- Locate phone, dial 911 from a LaRC landline or (757) 864-2222 from a cell phone to obtain Emergency Medical Services (EMS) support
- Locate AED and Responder
- Send someone to direct EMS to victim

⇩

- Begin CPR starting with compressions
- Give cycles of 30 compressions (at a depth of 2 to 2.4 inches) and 2 breaths (1 second each)
- Push hard and fast (at least 100-120 compressions/minute) and release chest completely

⇩

- AED Arrives
- Open the AED and turn it on
- Place pads on victims chest
- Clear victim to analyze

⇩

- Follow the AED voice prompts

⇩

- Continue CPR until EMS takes over or victim starts to move

Subject: Smoking Control Program

Responsible Office: Safety & Mission Assurance Office

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Change History Log

Revision	Date	Description of Change
Baseline	March 24, 2021	New document

PREFACE

P.1 PURPOSE

a. It is the policy of this Center that all personnel will work in a safe and healthy working environment. In compliance with 41 CFR §102-74.315, this policy will ensure that employees and the general public who visit the Center or use its facilities will not be exposed to tobacco product in any building or facility.

P.2 APPLICABILITY

a. This Langley Procedural Requirement (LPR) is applicable to all NASA Langley Research Center (LaRC) organizations and all federal civil service personnel on Center.

b. This LPR is applicable to contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, agreements, or grants.

c. This policy applies to all smoking on Center, which includes tobacco and electronic devices (e.g., e-cigarettes, vaping devices).

d. Noncompliance with the requirements of this LPR may result in appropriate disciplinary action against civil service personnel or sanctions against contractors in accordance with the terms of their contracts.

e. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term “shall.” The terms “may” denotes a discretionary privilege or permission, “can” denotes statements of possibility or capability, “should” denotes a good practice and is recommended, but not required, “will” denotes expected outcome, and “are/is” denotes descriptive material.

f. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

a. Smoking, 41 CFR 102-74, subpts. 315-351.

b. NPR 1800.1, NASA Occupational Health Program Procedures.

P.4 APPLICABLE DOCUMENTS AND FORMS

a. Smoking, 41 CFR 102-74, subpts. 315-351.

b. LMS-CP-7151, Obtaining Waivers for Langley Management System (LMS) Requirements.

P.5 MEASUREMENT/VERIFICATION

None

P.6 CANCELLATION

LAPD 1820.1, dated March 9, 2017

/s/ David F. Young March 24, 2021

Center Deputy Director Date

Distribution: Approved for public release via the Langley Management System; distribution is unlimited.

CHAPTER 2: SMOKING CONTROL PROGRAM

2.1 INTRODUCTION

2.1.1 Smoking, which includes tobacco and electronic devices (e.g., e-cigarettes, vaping devices) using tobacco or nicotine, is prohibited:

a. Inside any building on the grounds of NASA Langley Research Center, and inside any buildings owned, rented, or leased by the executive branch of the Federal Government per 41 CFR 102-74, subpts. 315-351.

b. Inside any vehicle owned or managed by NASA or the General Services Administration.

c. Inside any aircraft owned, operated, or managed by NASA or the General Services Administration.

d. Outside all buildings within 50 feet from primary entryways, handicap ramps, areas in front of air intake ducts, and operable windows.

2.1.2 Primary entryways are those areas used for ingress/egress into a building or complex by a majority of personnel and customers on a regular, routine, day-to-day basis. Often these entries are determined by the available parking that is adjacent to the entryways. Complexes are defined as those buildings that are connected but have been designated with an A, B, or C, etc.

2.1.3 Some areas outside of entryways not used on a routine basis by a majority of personnel or customers may be designated as a smoking area as long as they are not within 50 feet of operable windows and air intakes. Facility Coordinators (FCs) shall designate smoking areas, with the approval of the LaRC Occupational Health Officer (OHO). The Safety and Mission Assurance Office can provide the name of the LaRC OHO.

2.1.4 FCs shall ensure that designated smoking areas are properly identified with the appropriate signage.

2.1.5 The presence of ash receptacle(s) outside entryways are primarily for disposal of tobacco waste. They do not automatically establish an entryway as an approved designated smoking area. FCs are encouraged not to place ash receptacle(s) within 50 feet of primary entryways.

2.2 WAIVERS

2.2.1 Requests for waivers to any of the requirements in this LPR shall be processed in accordance with LMS-CP-7151, “Obtaining Waivers for Langley Management System (LMS) Requirements.”

2.3 RESPONSIBILITIES

2.3.1 LaRC Occupational Health Officer shall:

a. Act as final authority on all unresolved issues that arise relative to the Center’s Smoking Control Program.

b. Consult with the Langley Labor Relations Officer and a representative designated by American Federation of Government Employees (AFGE) Local 1923 prior to the change of any area to a smoking or non-smoking area.

c. Approve the designation of all designated smoking areas.

d. Issue “Smoking Permitted” signs to Facility Coordinators.

2.3.2 Facility Coordinators shall:

a. Ensure that signs designating smoking areas are posted only in areas approved for smoking.

b. Work with supervisors to ensure enforcement of the Center’s Smoking Control Program.

c. Report any issues to the LaRC OHO.

d. Consult with the LaRC OHO prior to the removal of any designated smoking area.

2.3.3 Supervisors shall:

a. Ensure their employees abide by the Center’s smoking policy.

b. Serve as liaison to personnel, through the LaRC OHO, regarding smoking cessation programs.

2.3.4 Personnel shall:

a. Adhere to this policy.

b. Bring unresolved conflicts to the attention of the appropriate supervisor.

APPENDIX A. DEFINITIONS

Complexes. Buildings that are connected but have been designated with an A, B, or C, etc.

Primary Entryways. Areas used for ingress/egress into a building or complex by a majority of personnel and customers on a regular, routine, day-to-day basis.

APPENDIX B. ACRONYMS

AFGE	American Federation of Government Employees
CFR	Code of Federal Regulations
FC	Facility Coordinator
LaRC	Langley Research Center
LPR	Langley Procedural Requirement
OHO	Occupational Health Officer

Subject: Bloodborne Pathogens Program

Responsible Office: Safety & Mission Assurance Office

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Baseline	March 24, 2021	New document

PREFACE

P.1 PURPOSE

a. This chapter sets forth the procedural requirements and responsibilities for the Langley Research Center (LaRC) Exposure Control Plan under the direction of the Safety and Facility Assurance Branch (SFAB), Safety and Mission Assurance Office (SMAO). It provides specific requirements for protective measures to be taken to eliminate or minimize occupational exposure to bloodborne pathogens in accordance with OSHA standard 29 CFR §1910.1030.

b. Given that NASA LaRC has a level of occupational exposure different from a traditional healthcare environment, the scope of this requirement addresses the unique needs of this Center. This applies to the occupational exposure of responders to workplace emergencies and incidents where the involvement of personnel in the response is rendered only as a collateral duty. This is consistent with OSHA's compliance directive (CPL) 02-02-069, "Enforcement Procedures for the Occupational Exposure to Bloodborne Pathogens."

P.2 APPLICABILITY

a. This Langley Procedural Requirement (LPR) is applicable to all NASA LaRC organizations and all federal civil service personnel on Center.

b. This LPR is applicable to contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, agreements, or grants.

c. Noncompliance with the requirements of this LPR may result in appropriate disciplinary action against civil service personnel or sanctions against contractors in accordance with the terms of their contracts.

d. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term "shall." The terms "may" denotes a discretionary privilege or permission, "can" denotes statements of possibility or capability, "should" denotes a good practice and is recommended, but not required, "will" denotes expected outcome, and "are/is" denotes descriptive material.

e. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

a. Bloodborne Pathogens, 29 CFR §1910.1030.

b. OSHA Compliance Directive (CPL) 02-02-069, Enforcement Procedures for the Occupational Exposure to Bloodborne Pathogens.

c. NPR 1800.1, NASA Occupational Health Program Procedures.

d. NPD 1800.2, NASA Occupational Health Program.

P.4 APPLICABLE DOCUMENTS AND FORMS

a. Recording and Reporting Occupational Injuries and Illnesses, 29 CFR pt. 1904.

b. Access to Employee Exposure and Medical Records, 29 CFR §1910.1020.

c. Bloodborne Pathogens, 29 CFR §1910.1030.

d. LMS-CP-7151, Obtaining Waivers for Langley Management System (LMS) Requirements.

e. LF 8, Exposure Report Form.

f. LF 53, Hepatitis B Vaccination Consent/Documentation/Declination Form.

g. LF 95, Supervisor's Report of Accident.

h. LF 585, Report of Work Related Injury.

i. 9 VAC 20-120-280, Containment and Cleanup Procedures, of the Code of Virginia, Regulated Medical Waste Management.

P.5 MEASUREMENTS/VERIFICATION

None

P.6 CANCELLATION

LPR 1800.3C, dated April 6, 2018

/s/ David F. Young March 24, 2021

Center Deputy Director Date

Distribution: Approved for public release via the Langley Management System; distribution is unlimited.

CHAPTER 3: BLOODBORNE PATHOGENS PROGRAM

3.1 INTRODUCTION

3.1.1 The purpose of this Exposure Control Plan is to assist the Center in implementing and ensuring compliance with established standards designed to protect personnel from serious injuries or illnesses caused by occupational exposure to bloodborne pathogens (BBP). This document addresses:

a. Explanations/definitions of terms,

b. Responsibilities,

c. Training/communications,

d. Exposure incidents, and

e. Recordkeeping.

3.2 WAIVERS

3.2.1 Requests for waivers to any of the requirements in this LPR shall be processed in accordance with LMS-CP-7151, “Obtaining Waivers for Langley Management System (LMS) Requirements.”

3.3 CATEGORY I AND II PERSONNEL

3.3.1 OSHA requires employers to perform an exposure determination of all personnel who may incur occupational exposure to blood or other potentially infectious materials (OPIM). The exposure determination is made without regard to the use of personal protective equipment (PPE) (i.e., personnel are considered to be exposed even when they wear PPE). Personnel are designated as Category I or II according to the risk of exposure to blood or OPIM, as determined by their supervisors.

a. Category I – Job classifications in which all personnel have occupational exposure:

(1) Healthcare professionals (e.g., medical technologists, nurses, healthcare providers).

(2) Center Maintenance Operations and Engineering Contract (CMOE) Spill Response Team.

b. Category II – Job classifications in which some personnel have occupational exposure:

(1) Childcare workers.

(2) Radiology technologists, when positioning a patient for x-ray in the presence of blood or OPIM.

3.3.2 Category I and II personnel shall be offered the Hepatitis B vaccination series within 10 days of initial work assignment.

3.3.3 Category I and II personnel shall be given a Hepatitis B consent/declination form (Langley Form (LF) 53) by a licensed nurse at the LaRC Occupational Health Clinic. Personnel may also request antibody testing if they may have had the vaccine previously.

3.3.4 All organizations with Category I and II personnel are required to have sub-exposure plans (i.e., a specific exposure plan for the personnel in their organization).

3.3.5 At LaRC, these organizations include the LaRC Occupational Health Clinic, Exchange Child Development Center, and the CMOE Spill Response Team.

3.4 RESPONSIBILITIES

3.4.1 The LaRC Occupational Health Officer (OHO) in consultation with the LaRC Medical Director shall:

a. Be responsible for implementing the LaRC Bloodborne Pathogens Program.

b. Maintain, review, and update this exposure control plan whenever necessary to include new or modified tasks and procedures.

c. Provide oversight to the LaRC Occupational Health Clinic.

d. Ensure that all medical actions required under this program are performed and that appropriate personnel health and OSHA records are maintained in a secure location.

e. Advise and assist, on request, organizations in the development of their bloodborne pathogens exposure control plan.

f. Provide health care professional(s) with the following after an exposure incident:

(1) A description of the individual's job duties relevant to the exposure incident.

(2) Route(s) of exposure.

(3) Circumstances of exposure.

(4) If possible, results of source individual blood test.

(5) Relevant individual medical records, including vaccination status.

g. Provide an affected individual with a copy of the evaluating health care professional's written opinion within 15 days after completion of the evaluation.

h. Review the circumstances of all exposure incidents per Section 3.5.9.

i. Ensure that appropriate changes are made to this plan.

(1) Changes may include an evaluation of safer devices, implementation of revised OSHA guidelines, changes in work practices, or similar alterations.

(2) Annual review and update of this plan, or more frequently, to reflect any new or modified tasks and procedures that affect occupational exposure.

3.4.2 Supervisors of Category I and II personnel shall:

a. Be responsible for implementing applicable regulations, thereby enhancing a safe work environment.

b. Provide resources and direction for compliance with OSHA regulations and this plan.

c. Provide training during initial personnel orientation in adherence to OSHA standards, including OSHA's Universal Precautions (29 CFR §1910.1030) when rendering first aid.

d. Ensure their personnel are offered Hepatitis B vaccination series within the first 10 days of initial work assignment at no cost to them. If declined, the Hepatitis vaccination series will be offered to the personnel at any time upon request and at least during each subsequent protocol/surveillance examination.

Note: Civil service personnel can receive the Hepatitis B vaccination series at the Occupational Health Clinic at no cost to them. Vaccinations for contractor personnel are the responsibility of the contracting company.

e. Refer personnel with occupational exposures to bloodborne pathogens to the LaRC Occupational Health Clinic for evaluation and consultation.

f. Perform and coordinate required investigations of exposure incidents, using LF 8.

g. Provide annual and supplemental training on Universal Precautions and bloodborne pathogens to personnel, to include:

(1) An explanation of what constitutes an exposure incident.

(2) An explanation of the use and limitations of work practices and PPE.

(3) An explanation of the types, uses, locations, removal, handling, decontamination, and disposal of PPE.

(4) Information on the appropriate actions to take and persons to contact in an emergency involving blood or OPIM.

(5) An opportunity for interactive questions and answers with a trainer familiar with teaching lay personnel about the delivery of emergency care.

h. Provide PPE appropriate to the work environment.

i. Complete training records for each personnel after training. These records are to be kept for a minimum of three years by the supervisor and include the dates of the training sessions, the contents or a summary of the training sessions, the names and qualifications of trainers, and the names and job titles of all personnel attending the training sessions.

j. Ensure their personnel's personal garments contaminated with blood or OPIM are laundered by a service that is certified to handle such items.

3.4.3 Category I and II personnel shall:

a. Conduct tasks and procedures in a manner that minimizes risk to themselves and others.

b. Attend annual bloodborne pathogen training.

c. Use caution when assisting injured individuals to prevent contact with the injured individual's blood or body fluids.

d. NOT clean up areas that have been contaminated with blood or other body fluids, as they will be cleaned by properly trained staff. If exposure to blood or OPIM

occurs, seek medical care and evaluation at the LaRC Occupational Health Clinic.

e. Report mishaps to the immediate supervisor and Center emergency response personnel.

f. Adhere to engineering and work practice controls.

g. Use available PPE, observing the following precautions:

(1) Remove PPE after it becomes contaminated and before leaving the work area.

(2) Wash hands immediately or as soon as feasible after removing gloves or other PPE.

(3) Dispose of used PPE by transferring it to Emergency Medical Service (EMS) personnel upon their arrival at the scene. PPE will not be disposed of in standard trash receptacles.

(4) If available, wear protective gloves if hand contact with blood or OPIM is reasonably anticipated, and when handling or touching contaminated items or surfaces. Replace gloves if torn, punctured, or contaminated, or when their ability to function as a barrier is compromised.

(5) Never wash or decontaminate disposable gloves for reuse.

(6) When available, use cardiopulmonary resuscitation (CPR) shields/masks with a one-way barrier device when providing rescue breathing.

(7) Remove immediately or as soon as feasible any garment contaminated by blood or OPIM, in such a way as to avoid contact with the contaminated surface.

(8) Transfer any waste product with blood or OPIM to EMS when they arrive to transport a victim. Labeling of infectious waste generated at the scene will be conducted by EMS as part of the transfer procedure.

3.4.4 LaRC Occupational Health Clinic shall:

a. Advise LaRC management on matters concerning bloodborne pathogens.

b. Provide medical management support during exposure incidents.

c. Provide medical support to personnel who experience occupational exposure to bloodborne pathogens.

(1) Appropriate post-exposure evaluation, prophylaxis, and follow-up will be provided. When requested, confidential psychological counseling is available to government personnel through the Employee Assistance Program (EAP).

(2) The Hepatitis B vaccine shall be offered within 24 hours to all government personnel who are unvaccinated first aid responders (i.e., automated external defibrillator (AED)/CPR) and who render assistance in any situation involving the presence of blood or OPIM, regardless of whether an actual “exposure incident” occurred.

(3) LF 53 shall be filled out for each person offered the Hepatitis B vaccine and kept with medical records.

d. Assist in investigating/managing exposure incidents and report findings to LaRC management and agencies as required.

e. Maintain medical records:

(1) Medical records are maintained for all personnel with an occupational exposure in accordance with 29 CFR §1910.1020, “Access to Employee Exposure and Medical Records.” A written statement will be provided to the exposed individual stating that the individual has been informed of the results of the evaluation and any exposure-related condition that requires additional assessment and treatment.

(2) These confidential records shall be retained for 30 years post-employment.

(3) A copy of an individual’s medical record shall be provided to the individual or a designated recipient upon written consent from the individual within 15 working days.

(4) Requests for copies of personnel medical records shall be sent to the LaRC Occupational Health Clinic, Building 1216, Mail Stop 409.

(5) The Office of Chief Counsel can be consulted regarding content, disclosure, and release of medical records.

f. Transfer relevant medical records to health care provider(s) designated by an exposed person with written consent.

g. Provide initial evaluation and first aid treatment of contractors after an exposure incident.

(1) Contractors who perform tasks that may result in an occupational exposure shall comply with their employer’s Bloodborne Pathogens Exposure Control Plan.

(2) After an “exposure incident,” contractor personnel are authorized to have an initial evaluation and first aid treatment at the LaRC Occupational Health Clinic.

(3) Contractors shall be assisted in obtaining follow up evaluation and treatment by an outside provider or facility if required.

h. Provide confidential medical evaluations and follow-up care for civil servants after an exposure incident per Section 3.5.5.

i. Evaluate all exposure incidents to determine if the case meets OSHA’s recordkeeping requirements (29 CFR pt. 1904). At a minimum, an LF 585 or an LF 8, as appropriate, shall be completed and the information input into the incident reporting information system (i.e., NASA Mishap Information System (NMIS)) when a recordable injury results from an accident/incident or exposure to bloodborne pathogens and:

(1) Is a work-related injury that involves loss of consciousness, transfer to another job, change in working conditions or duty restrictions; or

(2) Results in a recommendation for medical treatment beyond first aid (e.g., gamma globulin, Hepatitis B immune globulin, Hepatitis B vaccine) regardless of dosage; or

(3) Results in a disease process.

3.4.5 Center Operations Directorate

3.4.5.1 The Center Operations Directorate (COD) shall provide response capability for large scale events with blood and OPIM through the CMOE Spill Response Team and ensure that these materials are disposed of properly according to all applicable regulations.

3.5 POST-EXPOSURE MANAGEMENT

3.5.1 In the event of any known or suspected occupational exposure to blood or potentially infectious materials, the exposed personnel shall report promptly to a supervisor and the LaRC Occupational Health Clinic for medical aid and consultation. Personnel should call 911 from any Center telephone or (757) 864-2222 (LaRC Dispatch Office) from a cellular telephone for medical and emergency assistance.

3.5.1.1 After regular work hours, personnel should call 911 from any Center telephone or (757) 864-2222 (LaRC Dispatch Office) from a cellular telephone for appropriate first aid and decontamination, or assistance in reporting to a local hospital emergency room and report to the LaRC Occupational Health Clinic upon reporting for duty on the next regular work day.

3.5.1.2 The scene shall be preserved, if appropriate, for accident investigation, while preventing subsequent exposure risk.

3.5.2 The supervisor is responsible for ensuring exposed personnel receive all appropriate medical care and for taking appropriate corrective actions.

3.5.3 If the source individual is known or can be identified, it is appropriate for the supervisor to suggest that the individual report to the LaRC Occupational Health Clinic for consultation and treatment, without discussion of blood testing. These proceedings should be documented; however, the source individual cannot be named in the record without written consent.

3.5.4 It is the supervisor’s responsibility to enable the personnel to schedule and attend appointments for consultation, treatment, and counseling.

3.5.5 An immediately available confidential medical evaluation and follow-up shall be conducted by the LaRC Occupational Health Clinic. Following initial first aid (e.g., clean the wound, flush eyes or other mucous membrane), the following activities shall be performed:

a. Document the routes of exposure and how the exposure occurred.

b. Identify and document the source individual (unless the employer can establish that identification is infeasible or prohibited by state or local law).

c. Obtain consent and arrange to have the source individual tested as soon as possible to determine human immunodeficiency virus (HIV), hepatitis C virus (HCV), and hepatitis B virus (HBV) infectivity and document that the source

individual's test results were conveyed to the individual's health care provider. If the source individual is already known to be HIV, HCV, and/or HBV positive, new testing does not need to be performed.

d. Ensure that the exposed individual is provided with the source individual's test results and with information about applicable disclosure laws and regulations concerning the identity and infectious status of the source individual (e.g., laws protecting confidentiality).

e. After obtaining consent, collect the exposed individual's blood as soon as feasible after the exposure incident and test the blood for HBV and HIV serological status.

f. Preserve the baseline blood sample for at least 90 days if the individual refuses HIV serological testing during the collection of blood. If the exposed individual elects to have the baseline sample tested during this waiting period, perform testing as soon as feasible.

g. Recommend and offer follow-up testing at 3, 6, and 12 months after incident. Subsequent follow-ups shall be offered in accordance with current and/or newly implemented recommendations of the U.S. Centers for Disease Control and Prevention (CDC), OSHA, and the LaRC Medical Director.

3.5.6 The LaRC Occupational Health Officer and the LaRC Medical Director shall ensure that the LaRC Occupational Health Clinic staff responsible for providing Hepatitis B vaccinations, post-exposure evaluations, and follow-ups are knowledgeable of OSHA's bloodborne pathogens standard.

3.5.7 The LaRC Medical Director shall ensure that the health care professional evaluating personnel after an exposure incident receives the following:

a. A description of the individual's job duties relevant to the exposure incident.

b. Route(s) of exposure.

c. Circumstance of exposure.

d. If possible, results of the source individual's blood test.

e. Relevant personnel medical records, including vaccination status.

3.5.8 The LaRC Medical Director shall ensure that the individual receives a copy of the evaluating health care professional's written opinion within 15 days after completion of the evaluation.

3.5.9 The LaRC Occupational Health Officer and LaRC Medical Director shall review the circumstances of all exposure incidents to determine:

a. Engineering controls in use at the time (if applicable).

b. Work practices followed.

c. PPE or clothing that was used at the time of the exposure incident (e.g., gloves, CPR shields/masks).

d. Disposition of contaminated PPE and garments.

e. Location of the incident (e.g., office, parking lot, shop, cafeteria).

f. Procedure being performed when the incident occurred (e.g., performing CPR, rendering wound care).

g. Exposed individual's documented training (e.g., first aid, CPR, AED).

3.6 RECORDKEEPING

3.6.1 The Clinic shall ensure all required records are input into the incident reporting information system (i.e., NMIS).

3.6.2 Access to personnel exposure and medical records shall be in accordance with 29 CFR §1910.1020 and the Privacy Act of 1974 (5 U.S.C. §522(a)).

3.6.3 The LaRC Occupational Health Clinic shall maintain personnel exposure and medical records in accordance with the requirements of 29 CFR §1910.1020.

3.6.4 Contractor companies shall maintain all documentation personnel exposure and medical records for their personnel in accordance with the requirements of 29 CFR §1910.1020.

3.6.5 Contractor companies shall maintain all documentation concerning the training of their personnel handling bloodborne pathogen exposures per 29 CFR §1910.1030.

APPENDIX A. DEFINITIONS

Blood. Human blood, human blood components, and products made from human blood, including plasma, platelets, serosanguinous fluids (e.g., exudates from wounds).

Bloodborne Pathogens (BBP). Pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include Hepatitis B virus (HBV) and human immunodeficiency virus (HIV), and any pathogenic microorganism that is present in human blood and can infect and cause disease in persons who are exposed to blood containing the pathogen. Other examples include Hepatitis C, malaria, syphilis, babesiosis, brucellosis, leptospirosis, arboviral infections, relapsing fever, Creutzfeldt-Jakob disease, Human T-lymphotropic Virus Type 1, and viral hemorrhagic fever.

Contaminated. The presence or the reasonably anticipated presence of blood or other potentially infectious materials (OPIM) on a surface or in an item.

Decontamination. The use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

Engineering Controls. Controls (e.g., sharps disposal containers, self-sheathing needles) that isolate or remove the bloodborne pathogens hazard from the workplace.

Exposure Incident. A specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an individual's duties/activities. Non-intact skin includes skin with dermatitis, hangnails, cuts, abrasions, chafing, etc.

Hand Washing Facilities. A facility that provides an adequate supply of running potable water, soap, and single-use towels or hot air-drying machines.

Occupational Exposure. Reasonably anticipated potential for exposure; for example, skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an individual's duties.

Other Potentially Infectious Materials (OPIM). The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, and all body fluids in situations where it is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids, such as in emergency response. Any unfixed tissue or organ (other than intact skin) from a human (living or dead). HIV-containing cells or tissue cultures, organ cultures, and HIV- or HBV-containing culture media or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

Parenteral. Piercing mucous membranes or the skin barrier through such events as needle sticks, human bites, cuts, and abrasions.

Personal Protective Equipment (PPE). Specialized clothing or equipment worn or used by an individual for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts, or blouses) not intended to function as protection against a

hazard are not considered to be personal protective equipment. PPE is located with automated external defibrillators (AEDs) on the Center, and includes latex gloves and a disposable plastic CPR shield.

Source Individual. Any individual, living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to the individual. Examples include, but are not limited to, patients; trauma victims; human remains; donors of blood, blood components or organs; and subjects of emergency resuscitation.

Sterilize. The use of a physical or chemical procedure to destroy all microbial life, including highly resistant bacterial endospores. Sterilization includes procedures regulated by 9 VAC 20-120-280, “Containment and Cleanup Procedures,” of the Code of Virginia, “Regulated Medical Waste Management.”

Universal Precautions. An approach to infection control. According to the concept of Universal precautions, all human blood, and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens. Universal precautions do not apply to feces, nasal secretions, sputum, saliva, sweat, tears, urine, and vomitus, unless they contain visible blood. Adherence to safe work practices and appropriate use of personal protective equipment are essential basic elements of implementation.

Work Practice Controls. Controls that reduce the likelihood of exposure by altering the manner in which a task is performed (e.g., prohibiting recapping of needles by a two-handed technique).

APPENDIX B. ACRONYMS

AED	Automated External Defibrillator
BBP	Bloodborne Pathogens
CDC	U.S. Centers for Disease Control and Prevention
CFR	Code of Federal Regulations
CMOE	Center Maintenance Operations and Engineering Contract
COD	Center Operations Directorate
CPR	Cardiopulmonary Resuscitation
EAP	Employee Assistance Program
EMS	Emergency Medical Service
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
LaRC	Langley Research Center
LF	Langley Form
LPR	Langley Procedural Requirement
NMIS	NASA Mishap Information System
OHO	Occupational Health Officer
OPIM	Other Potentially Infectious Material
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment

Subject: Respiratory Protection Program

Responsible Office: Safety & Mission Assurance Office

TABLE OF CONTENTS

Change History Log

Revision	Date	Description of Change
Baseline	March 24, 2021	New document

PREFACE

P.1 PURPOSE

a. This Langley Procedural Requirement (LPR) document contains the requirements for the implementation of the NASA Langley Research Center (LaRC) Respiratory Protection Program. It provides both general and specific requirements for protective measures to be taken for personnel who may be exposed to toxic air contaminants and oxygen-deficient atmospheres. This LPR in no way relieves various NASA organizations and their associated contractors of the responsibility for the protection of personnel under their cognizance.

b. The requirements presented in this LPR implement federal Occupational Safety and Health Administration (OSHA) regulations and NASA management policy for industrial hygiene programs. NASA and contractor management will supplement the provisions of this procedural requirement by implementation of internal policies and instructions, as needed.

P.2 APPLICABILITY

a. This LPR is applicable to all LaRC organizations and all federal civil service personnel on Center.

b. This LPR is applicable to contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, agreements, or grants.

c. Noncompliance with the requirements of this LPR may result in appropriate disciplinary action against civil service personnel or sanctions against contractors in accordance with the terms of their contracts.

d. Contracting companies shall have a respiratory protection plan equivalent to this LPR and 29 Code of Federal Regulations (CFR) §1910.134.

e. Not all mandatory requirements for compliance with the OSHA Respiratory Protection Standard are repeated in this LPR, but can be found in 29 CFR §1910.134.

f. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term “shall.” The terms “may” denotes a discretionary privilege or permission, “can” denotes statements of possibility or capability, “should” denotes a good practice and is recommended, but not required, “will” denotes expected outcome, and “are/is” denotes descriptive material.

g. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

a. Occupational Safety and Health Programs for Federal Employees, E. O. 12196, 3 CFR 145 (1980).

b. Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters, 29 CFR pt. 1960.

c. NPR 1800.1, NASA Occupational Health Program Procedures.

d. NPR 8715.1, NASA Occupational Safety and Health Programs.

e. NPR 8715.3, NASA General Safety Program Requirements.

P.4 APPLICABLE DOCUMENTS AND FORMS

a. Privacy Act of 1974, 5 U.S.C. §552(a).

b. Occupational Safety and Health Standards, 29 CFR pt. 1910.

c. Safety and Health Regulations for Construction, 29 CFR pt. 1926.

d. Approval of Respiratory Protective Devices, 42 CFR pt. 84.

e. NPR 1800.1, NASA Occupational Health Program Procedures.

f. LPR 1740.6, Personnel Safety Certification.

g. LMS-CP-7151, Obtaining Waivers for Langley Management System (LMS) Requirements.

h. LF 65, Worker Certification Card.

i. LF 66, Worker Appointment and Certification Form.

j. LF 73, Self-Contained Breathing Apparatus (SCBA) Inspection & Maintenance Report (Weekly/Monthly Log on Back).

k. LF 433, NASA LaRC Safety Assessment.

l. American Conference of Governmental Industrial Hygienists (ACGIH), TLVs® and BEIs® (latest annual edition).

m. ANSI/ASSE Z88.2, American National Standard Practices for Respiratory Protection.

n. Compressed Gas Association (CGA) G-7.1, Commodity Specification for Air.

P.5 MEASUREMENTS/VERIFICATION

None

P.6 CANCELLATION

LPR 1710.17B, dated January 27, 2016

/s/ David F. Young March 24, 2021

Center Deputy Director Date

Distribution: Approved for public release via the Langley Management System; distribution is unlimited.

CHAPTER 4: RESPIRATORY PROTECTION PROGRAM

4.1 INTRODUCTION

4.1.1 This chapter provides instruction governing the issuance, maintenance, and use of respiratory protection devices on LaRC for civil service and contractor personnel.

4.2 WAIVERS

4.2.1 Requests for waivers to any of the requirements in this LPR shall be processed in accordance with LMS-CP-7151, “Obtaining Waivers for Langley Management System (LMS) Requirements.”

4.3 RESPONSIBILITIES

4.3.1 The LaRC Medical Director or a knowledgeable designated representative shall:

a. Provide medical evaluations to personnel identified by their organizations as respirator users.

b. Provide medical screening and surveillance examinations for those personnel who may be occupationally exposed to certain hazardous agents, as required by 29 CFR pt. 1910, 29 CFR pt. 1926, and/or other applicable NASA requirements.

c. Provide, on a case-by-case basis, special physical evaluations to personnel identified as being exposed or potentially exposed to hazardous atmospheres as the result of an accident, mishap, or other unusual circumstance.

d. Ensure that physical examination criteria is implemented to conform to the protocols defined by 29 CFR §1910.134 and NPR 1800.1 where required, and other nationally recognized standards as applicable.

e. Maintain records of all occupational medicine activities associated with support to the LaRC Respiratory Protection Program as defined by Federal regulation (e.g., OSHA, NASA health standards).

f. Provide personnel access to medical records in accordance with 29 CFR §1910.1020 and the Privacy Act of 1974 (5 U.S.C. §522(a)).

4.3.2 The LaRC Safety Manager shall:

a. Appoint by letter a Safety and Facility Assurance Branch (SFAB) Certified Industrial Hygienist (CIH) as Respiratory Protection Officer.

4.3.3 The LaRC Respiratory Protection Officer shall:

a. Manage the LaRC respiratory protection program.

b. Manage the SFAB industrial hygienist staff in completing the Respiratory Protection Program.

4.3.4 SFAB Industrial Hygienists (IH) shall:

a. Provide baseline surveys of operations, tasks, or procedures that possess the potential to create harmful air contamination.

b. Provide health hazard evaluations (per Section 4.5) of operations, tasks, or procedures where baseline surveys have shown the presence of harmful air contaminants at concentrations that may pose a health hazard to personnel.

c. Provide follow-up area and/or personal exposure monitoring in areas identified in health hazard evaluations as potentially posing a health hazard to personnel.

d. Test quarterly Grade D breathing air for self-contained breathing apparatus (SCBA) equipment and facilities to meet breathing air requirements as described in CGA G-7.1.

e. Provide the LaRC Medical Director or their designated representative access to exposure monitoring records.

f. Provide to supervisors, site managers, and responsible safety organizations in the affected work area:

(1) Results of surveys and recommendations,

(2) Recommended methods for the control or elimination of hazardous air contaminants,

(3) Requirements for personnel to participate in the LaRC Respiratory Protection Program, and

(4) Recommendations on the selection of respiratory protective equipment.

g. Notify supervisors of exposure monitoring results for affected personnel.

h. Review facility plans and operational procedures to assess the adequacy of precautions taken to control workplace air contaminants.

i. Provide technical assistance in the selection and design of engineering controls and work practices used to control or eliminate air contaminants.

j. Perform inspections of breathing air compressors and associated air filtration systems, as necessary.

k. Advise and assist in development of Respiratory Protection Program training courses.

4.3.5 Supervisors of civil servants shall:

a. Coordinate with appropriate safety and environmental health personnel to request workplace health hazard assessments of operations with suspected air contaminant generation.

b. Ensure personnel are certified and maintain certification per LPR 1740.6 requirements.

c. Purchase for their personnel the correct type and size respirator for which they have been fitted and certified.

d. Ensure the proper use of respiratory protection equipment, engineering controls, and established work practices to reduce workplace exposure to harmful air contaminants.

e. Not assign personnel to tasks requiring the use of respirators when they have facial hair, scars, missing dentures, or similar considerations that have the potential for causing leakage in the sealing surface of the respirator.

f. Notify affected personnel of the results of health hazard evaluations and exposure monitoring surveys per Section 4.5.

g. Ensure the proper care and maintenance of respirators issued to their personnel.

h. Maintain a current list of personnel with respirator use certifications.

i. Review Safety Data Sheets for hazardous materials with the affected personnel when respiratory protection equipment must be worn for protection from those materials.

j. Assist in the development of strategies to control or eliminate exposure to hazardous air contaminants.

4.3.6 Contract Employers shall:

a. Coordinate with appropriate safety and environmental health personnel to request workplace health hazard assessments of operations with suspected air contaminant generation.

b. Ensure personnel are certified and maintain certification per LPR 1740.6 requirements.

c. Ensure that personnel who have a medical evaluation by a Physician or Licensed Health Care Professional (PLHCP) outside of the LaRC Occupational Health Clinic have the appropriate documentation on file that states conformity and compliance with OSHA’s medical evaluation guidelines.

d. Verify that personnel are issued the correct type and size respirator for which they have been fitted and certified.

e. Ensure the proper use of respiratory protection equipment, engineering controls, and established work practices to reduce workplace exposure to harmful air contaminants.

f. Not assign personnel to tasks requiring the use of respirators when they have facial hair, scars, missing dentures, or similar considerations that have the potential for causing leakage in the sealing surface of the respirator.

g. Notify affected personnel of the results of health hazard evaluations and exposure monitoring surveys per Section 4.5.

h. Ensure the proper care and maintenance of respirators issued to their personnel.

i. Maintain a current list of personnel with respirator use certifications.

j. Review Safety Data Sheets for hazardous materials with the affected personnel when respiratory protection equipment must be worn for protection from those materials.

k. Assist in the development of strategies to control or eliminate exposure to hazardous air contaminants.

4.3.7 Facility Safety Heads (FSHs) shall:

a. Ensure that personnel within their facilities, who fall under the parameters outlined in Section 4.4.1 are trained and certified per the requirements of LPR 1740.6.

b. Develop and maintain a list of personnel (civil service and contractor) who have been trained and certified as respirator users in accordance with this LPR.

4.3.8 Respirator Users shall:

a. Be trained in accordance with LPR 1740.6.

b. Use control procedures established to maintain air contaminant control, including wearing and maintaining respiratory protective devices, as instructed.

c. Cooperate with supervisory, medical, environmental health, and safety personnel in activities to evaluate and control air contaminant hazards.

d. Notify supervisors of areas, operations, or equipment that may be a source of air contaminants.

e. Report any suspected exposures to their supervisors.

f. Civil service personnel requiring a respirator certification physical will complete an LF 66 and submit the form to the LaRC Occupational Health Clinic for evaluation.

g. Notify supervisors and the LaRC Occupational Health Clinic when changes in their health status may affect their ability to safely use respiratory protection.

4.4 RESPIRATORY PROTECTION

4.4.1 Use of respiratory protection devices shall be required whenever:

a. Personnel are required to work in hazardous atmospheres where the action level of the hazardous air contaminant is exceeded or oxygen deficient atmospheres are present.

b. Personnel are involved in the handling, transfer, or use of hazardous materials where the toxicity of the contaminant is of such a nature as to place those personnel at significant risk of serious illness or injury in the event of a leak, spill, or other release of the material.

c. Personnel are required to enter atmospheres that have unknown concentrations of oxygen and/or air contaminants.

d. An industrial hygienist or safety professional determines that personnel exposure(s) could exceed the relevant occupational exposure limit.

4.4.2 Only respirators certified by the National Institute for Occupational Safety and Health (NIOSH) shall be used at LaRC.

4.4.3 The selection of respirators for use on Center shall be based upon:

a. The nature of the hazard(s) associated with the operation or process;

b. The nature of the work operation or process;

c. The physical and chemical properties and additive effects of the air contaminant(s) (additional general considerations are particle size, sorbent efficiencies, odor warning properties, irritation potential, and lower flammability limit);

d. The adverse health effects of the air contaminant(s);

e. Warning properties of the hazardous air contaminant(s);

f. The relevant occupational exposure limits;

g. The measured concentration(s) of hazardous air contaminant(s);

h. Worker activities in the area of the operation and the potential stress of work conditions on personnel wearing the respirators;

i. The period of time respiratory protection will be worn by personnel during the work shift;

j. The physical characteristics, functional capabilities, and limitations of the respirator; and

k. The substance specific OSHA standard.

4.4.4 SCBA and escape respirators shall be reviewed by the LaRC Fire Chief before being procured for use at LaRC.

4.4.5 Selection of appropriate respiratory protection equipment shall take into account the Assigned Protection Factor (APF) for each type of respirator as listed in Appendix C, Table A of this LPR and OSHA specific substance standards. When using a combination respirator (e.g., airline respirators with an air-purifying filter), employers shall ensure that the APF is appropriate to the mode of operation in which the respirator is being used.

4.4.6 Respirator users shall be instructed in the limitations of the respirator and the proper procedures for their use, maintenance, and storage.

4.4.7 Where practical, respirators shall be issued to individual users for their exclusive use.

4.4.8 Supervisors shall have the day-to-day responsibility of insuring respiratory protection devices are replaced when necessary.

4.4.9 Personnel shall have the day-to-day responsibility of notifying their supervisors of any concerns related to the replacement or functionality of respiratory protection devices.

4.4.10 42 CFR pt. 84 will be consulted for selection and use limitations of particulate respirators.

4.4.11 Escape Respirators are required in work areas where:

a. Respirators may be used by personnel even though the concentrations of airborne contaminants would not be great enough to otherwise warrant such action. Personnel voluntarily using respirators shall follow all requirements as stated in this document.

4.4.12 Maximum Use Concentration (MUC)

4.4.12.1 As required by 29 CFR §1910.134:

a. When the calculated MUC exceeds the Immediately Dangerous to Life or Health (IDLH) level for a hazardous substance, or the performance limits of the cartridge or canister, employers shall set the maximum MUC at that lower limit.

b. The employer shall select a respirator for personnel use that maintains the individual's exposure to the hazardous substance, when measured outside the respirator, at or below the MUC.

c. Employers shall not apply MUCs to conditions that are IDLH; instead, they must use respirators listed for IDLH conditions in 29 CFR §1910.134(d)(2).

4.5 HEALTH HAZARD EVALUATION

4.5.1 An initial health hazard evaluation of potentially hazardous operations shall be conducted using LF 433 when any information, observation, or calculation shows that an individual may be exposed to oxygen-deficient atmospheres and/or air contaminants above their action levels. This includes, but is not limited to, data from monitoring of similar operations; procedure reviews; potential for skin and eye contact; and personnel complaints of unusual odors, irritations, or other signs or symptoms of potential exposures.

4.5.2 The health hazard evaluation shall evaluate and describe:

a. The operation, process, and/or equipment generating the air contaminant(s);

b. Their approximate concentrations;

c. Other operations in the area;

d. The number of potentially exposed personnel;

e. The duration and frequency of the exposure;

f. Respiratory protection requirements, including applicable respirator filter cartridge change out schedule;

g. Associated personal protective equipment; and

h. Any regulatory requirements applicable to the operation.

4.5.3 Health hazard evaluations shall be repeated whenever any changes to facilities, equipment, work practices, procedures, and/or engineering control measures are made.

4.5.4 Personnel and/or their representatives shall be provided an opportunity to observe area and personal exposure monitoring.

4.5.5 Results of health hazard evaluations shall be posted in the affected personnel's work areas or otherwise provided to affected personnel for their review.

4.6 MEDICAL AND TRAINING REQUIREMENTS

4.6.1 SFAB shall maintain a list of civil service personnel who are authorized to use respirators at LaRC.

4.6.2 Contractor personnel who are authorized to use respirators shall be listed on a contractor company authorization list.

4.6.3 Medical Surveillance

4.6.3.1 A medical evaluation is required for all personnel who are authorized to use respiratory protective equipment, except those voluntarily implementing the use of dust

masks (i.e., filtering facepieces).

4.6.3.2 Specific requirements for medical evaluation are defined in 29 CFR §1910.134, Appendix C, or as otherwise directed by the LaRC Medical Director.

4.6.3.3 The LaRC Medical Director may accept an already existing medical examination or written opinion from a licensed physician stating whether the individual has any detected medical condition which would place the individual's health at increased risk from respirator use and any recommended limitations on the use of respirators.

4.6.3.4 The LaRC Medical Director shall notify SFAB if the patient is approved or disapproved for respirator use.

4.6.3.5 Contractor programs shall have an equivalent medical surveillance program in place.

4.6.4 Changes in Medical Status

4.6.4.1 If the individual’s medical status changes or if the individual fails to report for the examination:

a. The LaRC Medical Director shall notify SFAB, in writing, per LF 66.

b. If an individual is no longer authorized to use a respirator, the SFAB shall immediately notify the individual’s supervisor and the FSH.

c. The FSH shall provide SFAB with written notification of the individual's change in duty status.

d. SFAB shall provide the LaRC Occupational Health Clinic or equivalent contractor company organization a copy of the individual’s change in duty status in writing, and the individual will be removed from medical surveillance.

4.6.4.2 Contractor programs shall notify the FSH of an individual's change in medical status or removal from the contractor respiratory protection program.

4.6.5 Personnel Training

4.6.5.1 SFAB shall provide to the user the basic safety respirator training or ensure that a similar training has been received by the user.

4.7 RESPIRATOR FIT TESTING

4.7.1 Qualitative and quantitative fit tests shall be performed only by qualified individuals specifically trained and assigned responsibility for providing respirator fit tests in accordance with 29 CFR §1910.134.

4.7.2 Fit test results shall be related to APFs as follows:

a. Half-mask, air-purifying respirators may be worn in atmospheres no greater than 10 times the established exposure limit, when the respirator user passes the qualitative fit test; or when the respirator user passes a quantitative fit test with a minimum fit factor of greater than 100.

b. Full-facepiece, air-purifying respirators may be worn in atmospheres no greater than 50 times the established exposure limit when the respirator user passes a quantitative fit test with a minimum fit factor greater than 500.

c. Powered, air-purifying respirators and supplied-air respirators with tight-fitting facepieces require fit testing. They may be used in atmospheres no greater than allowed by the APF for that respirator listed in Appendix C, Table A.

4.8 CERTIFICATION

4.8.1 All personnel authorized to wear respiratory protection devices, with the exception of voluntary use of disposable, single-use filtering facepieces, shall be certified as respirator users.

4.8.2 Personnel shall be certified and maintain certification per LPR 1740.6 requirements.

4.9 RESPIRATOR CARE AND MAINTENANCE

4.9.1 Cleaning and maintenance of respirators shall be in accordance with 29 CFR §1910.134, Appendix B-2.

4.10 SCBA/ESCAPE RESPIRATOR INSPECTION, MAINTENANCE, AND REPAIR

4.10.1 SCBA/Escape Respirator Inspections

4.10.1.1 SCBA respirators shall be inspected weekly and sanitized monthly or after each use as required by the manufacturer's recommendation and ANSI/ASSE Z88.2.

4.10.1.2 Additionally, the air cylinder shall be hydrostatically tested every five years.

4.10.1.3 Check sheets documenting the inspections shall be maintained at the facility by using LF 73.

4.10.2 SCBA/Escape Respirator Maintenance

4.10.2.1 When a Government-issued respirator has less than a full air cylinder, the unit shall be returned to the LaRC Fire Station, Building 1248, to be recharged.

4.10.2.2 The tank shall be charged until the gauge on the bottle reads “FULL.”

4.10.2.3 If defects are found during an inspection, they shall be brought to the attention of the supervisor and the FSH.

4.10.2.3.1 The defective SCBA shall be marked “**Danger - Defective Air Pack - Do Not Use**” and returned to the LaRC Fire Station for immediate repair.

4.10.2.4 Adjustments to SCBA equipment shall only be performed by certified personnel.

4.10.2.5 Contractor companies shall have an equivalent maintenance process in place.

4.10.2.6 Air supplied to compressed air cylinders shall meet the requirements of the specification for Grade D breathing air as described in CGA G-7.1.

Note: Grade D breathing air for SCBA equipment and facilities requiring breathing grade air is supplied through the compressor in the Fire Station, Building 1248. This breathing air is tested quarterly by an SFAB IH to meet the requirements of the specification for Grade D breathing air as described in CGA G-7.1.

4.10.3 SCBA/Escape Respirator Repairs

4.10.3.1 When a Government-issued respirator needs repairs, the unit shall be returned to the LaRC Fire Station, Building 1248.

4.10.3.2 The LaRC Fire Station shall maintain a detailed record of all repairs conducted on these systems.

4.11 PROGRAM EVALUATIONS

4.11.1 The LaRC Respiratory Protection Officer, or designee, will conduct periodic evaluations (per 29 CFR §1910.134(c)(1)(ix)) of the workplace at least once every three years to ensure that the requirements of this LPR are being implemented.

4.11.2 Evaluations will include consultations with personnel who use respirators and their supervisors, site inspections, air monitoring, and a review of records.

4.11.3 Problems identified shall be addressed by the LaRC Respiratory Protection Officer, or designee.

4.12 RECORDKEEPING

4.12.1 Access to personnel exposure and medical records shall be in accordance with 29 CFR §1910.1020 and the Privacy Act of 1974 (5 U.S.C. §522(a)).

4.12.2 The LaRC Occupational Health Clinic shall maintain personnel exposure and medical records in accordance with the requirements of 29 CFR §1910.1020.

4.12.3 Copies of this LPR, 29 CFR §1910.134 (OSHA Respiratory Protection Standard), other applicable OSHA regulations, and any appropriate records required by this LPR shall be provided, upon request, to personnel, former personnel, representatives of personnel, representatives of the U.S. Department of Labor, and NASA Headquarters personnel.

4.12.4 The LaRC Occupational Health Clinic shall maintain all documentation concerning the medical examination process for civil servants and for contractor companies that utilize the LaRC Clinic.

4.12.5 Contractor companies shall conduct a medical review of each proposed contractor respirator user and the results of the medical reviews shall be reported to the Contract Manager or designee.

4.12.6 Contractor companies shall maintain all documentation concerning the examination process.

APPENDIX A. DEFINITIONS

Action Level. A measured airborne concentration of an air contaminant that is equal to one-half the occupational exposure limit for the contaminant, or other concentration where specified by OSHA substance-specific standard.

Assigned Protection Factor (APF). The workplace level of respiratory protection that a respirator or class of respirators is expected to provide to personnel when the employer implements a continuing, effective respiratory protection program as specified by this section.

Filtering Facepiece. A negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

Immediately Dangerous to Life or Health Concentration (IDLH). Concentration at which serious health impairments, or irreversible biological effects possibly leading to death in a period of seconds or several days later, could occur.

Maximum Use Concentration (MUC). The maximum atmospheric concentration of a hazardous substance from which an individual can be expected to be protected when wearing a respirator. This is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the required OSHA permissible exposure limit, short-term exposure limit, or ceiling limit. When no OSHA exposure limit is available for a hazardous substance, an employer must determine an MUC on the basis of relevant available information and informed professional judgment.

Occupational Exposure. Reasonably anticipated potential for exposure that may result from the performance of an individual’s duties.

Occupational Exposure Limit (OEL). The more stringent of:

a. The permissible exposure level (PEL) for the hazardous chemical as listed in 29 CFR Part 1910, Subpart Z; or

b. The Threshold Limit Value (TLV) for the hazardous chemical assigned by the American Conference of Governmental Industrial Hygienists in the latest edition of “TLVs® and BEIs®”; or

c. Where there is no PEL, TLV, or NASA standard for the chemical, an exposure level based on available published scientific information such as Safety Data Sheets.

Respirator. Any device worn by an individual that is intended to provide the wearer with respiratory protection against inhalation of airborne contaminants or oxygen deficient atmospheres.

Immediately Dangerous to Life or Health (IDLH). An atmospheric concentration of any toxic, corrosive, or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere.

APPENDIX B. ACRONYMS

APF	Assigned Protection Factor
BEIs®	Biological Exposure Indices
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
FSH	Facility Safety Head
IDLH	Immediately Dangerous to Life or Health
IH	Industrial Hygienist
LaRC	Langley Research Center
LF	Langley Form
LPR	Langley Procedural Requirement
MUC	Maximum Use Concentration
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PLHCP	Physician or Licensed Health Care Professional
SCBA	Self-Contained Breathing Apparatus
SFAB	Safety and Facility Assurance Branch
TLV®	Threshold Limit Value

APPENDIX C. ASSIGNED PROTECTION FACTORS

Table A. Assigned Protection Factors

Assigned Protection Factors (APF)[9]					
Type of respirator [1,2]	Quarter Mask	Half Mask	Full Facepiece[5]	Helmet/ Hood	Loose-Fitting Facepiece
Air-Purifying Respirator[3]	5	10[4]	50	–	–
Powered Air-Purifying Respirator (PAPR)	–	50	1,000	25/1,000[8]	25
Supplied-Air Respirator (SAR) or Airline Respirator[6,7]					
Demand Mode	–	10	50	–	–
Continuous Flow Mode	–	50	1,000	25/1,000[8]	25
Pressure-Demand or Other Positive-Pressure Mode	–	50	1,000	–	–
Self-Contained Breathing Apparatus (SCBA)					
Demand Mode	–	10	50	50	–
Pressure-Demand or Other Positive-Pressure Mode (e.g., open/closed circuit)	–	–	10,000	10,000	–

Notes:

1. Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.
2. The assigned protection factors in Table A are only effective when the employer implements a continuing, effective respirator program including training, fit testing, maintenance, and use requirements.
3. Air-purifying respirators may not be used in oxygen deficient atmospheres.
4. This APF category includes filtering facepieces, and half masks with elastomeric facepieces.
5. Only full-facepiece respirators are to be used in contaminant concentrations that produce eye irritation.
6. Any supplied-air respirator may be used in an oxygen deficient atmosphere where the oxygen content is above the oxygen deficient IDLH limits.
7. Only a full facepiece pressure demand SCBA or combination full facepiece pressure demand SAR with auxiliary self-contained air supply may be used in unknown IDLH or oxygen deficient IDLH atmospheres.
8. The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a Workplace Factor or Simulated Workplace Factor study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.

9. These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 Subpart Z, employers will refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR §1910.134.

Subject: Personal Protective Equipment (PPE)

Responsible Office: Safety & Mission Assurance Office

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Change History Log

Revision	Date	Description of Change
Baseline	March 24, 2021	New document

PREFACE

P.1 PURPOSE

a. This Langley Procedural Requirement (LPR) establishes the standards for the management of Personal Protective Equipment (PPE) for civil servant and contractor personnel at Langley Research Center (LaRC).

b. The management of the PPE process includes the responsibilities for the hazard assessment, training, acquisition, issuance, proper use, control, and maintenance of these items.

P.2 APPLICABILITY

a. This LPR is applicable to all LaRC organizations and all federal civil service personnel on Center.

b. This LPR is applicable to contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, agreements, or grants.

c. Noncompliance with the requirements of this LPR may result in appropriate disciplinary action against civil service personnel or sanctions against contractors in accordance with the terms of their contracts.

d. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term “shall.” The terms “may” denotes a discretionary privilege or permission, “can” denotes statements of possibility or capability, “should” denotes a good practice and is recommended, but not required, “will” denotes expected outcome, and “are/is” denotes descriptive material.

e. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

a. Occupational Safety and Health Standards, 29 CFR 1910.

b. Safety and Health Regulations for Construction, 29 CFR 1926.

c. NPR 8715.1, NASA Occupational Safety and Health Programs.

d. NPR 8715.3, NASA General Safety Program Requirements.

P.4 APPLICABLE DOCUMENTS AND FORMS

a. LPR 1710.6, Electrical Safety.

b. LPR 1710.8, Non-Ionizing Radiation.

c. LPR 1710.12, Potentially Hazardous Materials – Hazard Communication Standard.

d. LPR 1710.13, Chemical Hygiene Plan.

e. LPR 1740.2, Facility Safety Requirements.

f. LMS-CP-7151, Obtaining Waivers for Langley Management System (LMS) Requirements.

g. LF 59, Certification for Industrial Grade Safety Glasses.

h. ANSI/ISEA Z87.1, American National Standard for Occupational and Educational Personal Eye and Face Protection Devices.

i. ANSI/ISEA Z89.1, American National Standard for Industrial Head Protection.

j. ISEA 107, American National Standard for High-Visibility Safety Apparel and Accessories.

k. ANSI Z359, Fall Protection Code.

l. ASTM F2412-18a, Standard Test Methods for Foot Protection.

m. ASTM F2413-18, Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear.

P.5 MEASUREMENTS/VERIFICATION

Verification and measurement for compliance to this directive will be tracked through annual Safety and Industrial Hygiene Audits performed by the Safety and Facility Assurance Branch (SFAB), the triennial Agency audits, and LaRC participation in the OSHA Voluntary Protection Program.

P.6 CANCELLATION

LPR 1710.4H, dated October 11, 2015

/s/ David F. Young March 24, 2021

Center Deputy Director Date

Distribution: Approved for public release via the Langley Management System; distribution is unlimited.

CHAPTER 5: PERSONAL PROTECTIVE EQUIPMENT

5.1 INTRODUCTION

5.1.1 This chapter provides guidance on the selection of Personal Protective Equipment (PPE). PPE shall be issued to civil service personnel at Government expense and to contractor personnel at the contracting company's expense in those situations where engineering controls, management controls, or other corrective actions have not reduced a hazard to an acceptable level or where use of engineering controls, administrative controls, or other techniques are not feasible.

5.1.2 PPE shall be provided and used whenever personnel encounter hazards in the work environment. Examples of hazards where PPE may be issued to personnel are listed in Table A.

Table A. Work Environment Hazards Potentially Requiring PPE.

General Hazard Categories	Examples of Specific Hazards
Biological hazards	Body fluids (bloodborne pathogens), animal bites, insect bites, toxins, allergens, pathogenic microbes, bird excrement, rodents
Chemical hazards	Flammability, corrosiveness, reactivity, toxicity, irritation, harmful dust, gases, vapors
Electrical hazards	Electric shock, electrical burns, electric arc blast, static electricity
Environmental hazards	Noise, bright light, darkness, cold or hot weather, high humidity, wet weather, high winds
Person-equipment hazards	Moving machinery or vehicles, sources of motion/moving parts, hazards from wearing incorrect or poor-fitting PPE, reduced mobility, impaired vision, poor communication
Person-position hazards	Falls from heights, engulfment (water, dirt, sand, etc.) low worker visibility, bumps into stationary objects/structures
Physical hazards	Flying debris, projectiles, falling objects, rough or abrasive surfaces, excessive vibration, high pressure (explosive potential)
Radiation hazards	Ionizing radiation (alpha, beta, gamma, X- ray) or Non-ionizing radiation (radar, microwave, radio frequency, laser, UV light, IR light, arc welding)
Thermal hazards	Flame, high heat, sparks, hot surfaces, hot liquids or gases, molten metal

5.2 WAIVERS

5.2.1 Requests for waivers to any of the requirements in this LPR shall be processed in accordance with LMS-CP-7151, “Obtaining Waivers for Langley Management System (LMS) Requirements.”

5.3 RESPONSIBILITIES

5.3.1 The Safety and Facility Assurance Branch (SFAB) Certified Industrial Hygienist (CIH) shall:

a. Provide advice concerning the determination and designation of areas and/or tasks where PPE is required to personnel, supervisors, contractors, Facility Safety Heads, and Facility Coordinators.

b. Provide advice concerning the selection of PPE.

c. Approve purchase requests for LaRC-furnished PPE.

5.3.2 The Occupational Health Clinic shall:

a. Provide medical consultation and evaluation for personnel required to wear PPE that requires medical qualification (e.g., respirator users, fall protection users).

b. Provide prescription safety glasses to civil service personnel requiring them per Section 5.8.2.

5.3.3 The Contract Manager or contracting company’s safety representative shall:

a. Determine the appropriate PPE for use by contractor personnel.

b. Approve the purchase of contractor-provided PPE.

c. Ensure contractor personnel receive instruction from the contracting company’s qualified person concerning the proper use of and limitations of PPE.

d. Contact the SFAB CIH if assistance is needed with hazard assessment, PPE selection, or training.

Note: Contractors at LaRC are responsible for the issuance of PPE in accordance with the terms and conditions of their contract or agreement.

5.3.4 Supervisors shall:

a. Assess workplace hazards and identify work areas, operations, and working conditions where PPE is required.

b. Ensure that all personnel are aware of the specific PPE requirements for work assignments and are trained in the proper use and limitations of those items.

c. Ensure that PPE is readily available, stored properly, and maintained in good condition.

d. Contact the SFAB CIH if assistance is needed with hazard assessment, PPE selection, or training.

5.3.5 Facility Safety Heads (FSHs) shall:

a. Coordinate with supervisors to ensure that their respective facilities maintain an adequate supply of required PPE.

b. Ensure that personnel and visiting personnel wear required protective equipment and devices while working in or visiting hazardous areas.

5.4 PROCUREMENT OF PPE

5.4.1 The purchase of PPE for civil service personnel shall require the approval of the SFAB prior to purchase to ensure the proper PPE is obtained for the task being performed.

5.4.2 The purchase of PPE for contractor personnel shall require the approval of the contracting company's safety representative prior to purchase to ensure the proper PPE is obtained for the task being performed.

5.5 ISSUANCE OF PPE

5.5.1 PPE shall be provided, used, stored, and maintained in a serviceable condition at all times.

5.5.2 PPE turned in by an individual or that has been worn by an individual shall be cleaned and sanitized prior to being reused or reissued to another individual.

5.5.3 Personnel shall be trained in the proper use of provided PPE. Items that may be issued by LaRC or a contracting company include, but are not limited to, the following:

a. Safety goggles and safety glasses (prescription and nonprescription);

b. Welding hard hats and shields;

c. Safety shoes and boots;

d. Aprons, suits, lab coats, and gloves (e.g., fire resistant materials, leather, rubber, cotton, and synthetics);

e. Protective headwear (e.g., hard hats and caps, liners, hard hats, and hoods);

f. Face shields;

g. Fall protection;

h. Respirators; and

i. Hearing protection.

Note: Requirements concerning shock and arc flash personal protective clothing and equipment are indicated in LPR 1710.6, "Electrical Safety."

5.6 CLEANING OF PPE

5.6.1 PPE shall be cleaned, decontaminated, or disposed of according to the processes and procedures established by each organization or according to the manufacturer's recommendation.

5.7 LOAN OF PPE

5.7.1 PPE is not normally issued to contractor personnel by the Government; however, the Contracting Officer Representative (COR) or on-site supervisor shall contact the SFAB CIH, who can authorize the issuance or loan of appropriate protective devices, in an emergency or when such issuance is beneficial to the Government.

5.8 EYE AND FACE PROTECTION

5.8.1 Safety Glasses

5.8.1.1 Nonprescription and prescription safety glasses (lenses and frames) used by personnel shall be manufactured to meet the requirements of ANSI Z87.1.

5.8.1.2 Safety glasses with side shields and full-face shields shall be worn when working in areas with flying objects or with explosive or highly hazardous materials.

5.8.1.3 Wearers of contact lenses shall be required to wear appropriate eye protection in LaRC hazardous work environments.

Note: In chemical work environments, contact lenses usage is not recommended.

5.8.1.4 For laser eye protection, see LPR 1710.8, “Non-Ionizing Radiation.”

5.8.2 Prescription Safety Glasses

5.8.2.1 Civil service personnel who are eligible for government-provided prescription safety glasses shall obtain them by requesting authorization from SFAB.

5.8.2.2 When initiating a request for safety glasses, civil service personnel shall submit a prescription less than two years old.

5.8.2.3 Upon SFAB verification of eligibility and need, SFAB shall issue Langley Form (LF) 59, “Certification for Industrial Grade Safety Glasses,” authorizing the individual to obtain prescription safety glasses through the Safety and Mission Assurance Office (SMAO)-contracted optical services company.

5.8.2.4 Upon receipt of authorization from SFAB and prescription from the individual, the SMAO-contracted optical services company shall arrange for the prescription safety glasses.

5.8.2.5 The repair or replacement of civil service supplied prescription safety glasses shall be borne by the Government, provided such repair or replacement is a result of normal wear and usage or accidental damage while performing work functions.

5.8.2.6 The cost of prescription safety glasses for civil servants shall be covered by the individual’s organization.

5.8.2.7 Contractor personnel shall be provided prescription safety glasses through their contractor company.

5.8.3 Protective Equipment/Face Shields

5.8.3.1 Face shields shall be required in work operations and work environments having the capacity to produce an injury to an individual’s eyes or face.

5.8.3.2 Face shields shall meet ANSI Z87.1.

5.8.3.3 Face shields are only supplementary protective devices worn to shield the face from certain hazards. They shall always be worn with safety glasses or goggles. Splash goggles and face shields are essential when there is a possibility of liquid splash; this is especially important for work with highly corrosive liquids or cryogenics.

5.9 PROTECTIVE FOOTWEAR

5.9.1 Protective footwear shall be provided to personnel engaged in work operations where there is a danger of foot injuries due to falling or rolling objects or objects piercing the sole, and where such personnel's feet are exposed to electrical hazards.

5.9.2 Civil service personnel engaged in continuous work situations where foot hazards are present shall be furnished appropriate protective footwear at no cost to the individual by the Government.

5.9.3 Contractor personnel engaged in continuous work situations where foot hazards are present shall be furnished appropriate protective footwear by their contractor company.

5.9.4 All protective footwear shall meet the requirements of ASTM F2412-18a and ASTM F2413-18.

5.10 HEARING PROTECTION DEVICES

5.10.1 Issues concerning Hearing Protection Equipment Program are indicted in Chapter 6 of this LPR.

5.11 PROTECTIVE HEADWEAR

5.11.1 Protective headwear shall be provided to personnel engaged in work operations where there is a potential for injury to the head from falling objects and when near exposed electrical conductors that could contact the head.

5.11.2 Civil service personnel working in areas where hazards to the head are present shall be furnished appropriate protective headwear at no cost to the individual by the Government.

5.11.3 Contractor personnel shall be furnished headwear by their contractor company.

5.11.4 All protective headwear shall meet the requirements of ANSI Standard Z89.1.

5.11.5 Protective hard hats are classified according to the specific impact and electrical performance requirements they are designed to meet.

5.11.6 In accordance with ANSI Standard Z89.1, all protective hard hats shall meet either Type I or Type II impact requirements.

5.11.7 All hard hats are further classified as meeting Class G or E electrical requirements (e.g., Type I, Class G, or Type II, Class E).

5.11.8 Impact Types:

a. Type 1 – Hard hats intended to reduce the force of impact resulting from a blow only to the top of the head.

b. Type 2 – Hard hats intended to reduce the force of impact resulting from a blow, which may be received off-center or to the top of the head.

5.11.9 Electrical Classes:

a. Class G (General) – Hard hats intended to reduce the danger of contact exposure to low voltage conductors.

b. Class E (Electrical) – Hard hats intended to reduce the danger of exposure to high voltage conductors.

5.11.10 Hard Hat Accessories

5.11.10.1 Hard hat accessories, as indicated below, are permissible if manufactured and used in accordance with the requirements of ANSI Standard Z89.1:

a. Sweatbands of the removable/replaceable type or that are integral to the headband.

(1) Sweatbands shall cover the hard hat suspension at the forehead.

b. Winter liners made of suitable materials that do not affect the protective capabilities of the hard hat.

(1) There shall be no metal parts in winter liners intended for use with hard hats labeled as meeting Class E requirements.

5.11.11 Hard hats shall routinely be inspected for damage and to ensure that they are within the manufacturer's expiration date. If damage is found or if the hard hat is expired, it should be immediately removed from service.

5.12 GLOVES

5.12.1 Protective hand wear shall be provided to personnel engaged in work operations where their hands are exposed to hazards, such as:

a. Skin absorption of harmful substances,

b. Severe cuts or lacerations,

c. Severe abrasions,

d. Punctures,

e. Chemical burns,

f. Thermal burns, and

g. Harmful temperature extremes.

5.12.2 The appropriate protective hand wear shall be determined by an evaluation of the tasks (e.g., hazard analysis) to be performed, including the conditions present, duration of the task, and the hazards and potential hazards identified during the evaluation.

5.12.3 Supervisors in conjunction with the FSH shall ensure the appropriate evaluation is completed.

5.12.4 Civil service personnel engaged in work situations where hand hazards are present shall be furnished appropriate protective hand wear at no cost to the individual by the Government.

5.12.5 Contractor personnel engaged in work situations where hand hazards are present shall be furnished appropriate protective hand wear by their contractor company.

5.12.6 Additional requirements for protective hand wear shall be obtained through:

a. LPR 1710.6, “Electrical Safety.”

b. LPR 1710.12, “Potentially Hazardous Materials.”

c. LPR 1710.13, “Chemical Hygiene Plan.”

5.13 FALL PROTECTION

5.13.1 Requirements regarding the need for and the proper use of fall protection equipment are detailed in LPR 1740.2.

5.13.2 Fall Protection Equipment

5.13.2.1 All personal fall protection equipment used shall meet the requirements of ANSI Z359 Fall Protection Code.

5.13.2.2 Contracting companies shall supply their personnel with fall protection equipment that complies with ANSI Z359.

Note: Equipment that does not meet ANSI Z359 Fall Protection Code requires review and approval by the LaRC Fall Protection Program Administrator.

5.13.2.3 All fall protection equipment shall be initially inspected by a competent person before being placed into service at the Center.

5.13.2.4 Fall protection equipment shall be inspected by a competent person at intervals of no more than one year or as prescribed by the manufacturer of the equipment.

5.13.2.5 Inspection of the equipment by the competent person shall be documented or the tag on the equipment shall be checked and dated by the competent person on the date of inspection.

5.13.2.6 Contracting companies shall follow a similar procedure to ensure inspection of their fall protection equipment.

5.14 PROTECTIVE CLOTHING

5.14.1 Garments such as cotton laboratory coats and Tyvek® coveralls shall be worn if there is a possibility that personal clothing could become contaminated with a hazardous material.

5.14.2 Apparel that is contaminated with hazardous materials shall be removed and not worn outside the work area.

5.14.3 Protective apparel shall be selected with consideration of all the hazards involved.

5.14.3.1 For example, cotton coats do not burn readily but they react rapidly with acids. Impervious aprons are essential when chemical splash is possible. However, plastic aprons can accumulate static electricity, and so they should not be used around flammable solvents or materials that can be ignited by static discharge. Some disposable garments provide only limited protection from vapor or gas penetration. Polyester coats are not suitable for work with flame, hot objects, or flammable materials. Additional items, such as gauntlets for arm protection, may be advisable for some operations with hazardous liquids. Equipment selected shall function effectively in an environment of combined hazards.

5.14.4 High visibility clothing that meets ISEA 107 requirements shall be worn when working around moving traffic or construction equipment.

5.14.5 Electrical/Arc Flash Protective Clothing requirements are detailed in LPR 1710.6.

5.15 RECORDKEEPING

5.15.1 SMAO shall track government-issued fall protection equipment.

5.15.2 The list shall include dates of equipment inspections.

APPENDIX A. DEFINITIONS

Competent Person. One who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to personnel, and who has authorization to take prompt corrective measures to eliminate them.

Protective Clothing. An article of clothing furnished to personnel at Government or contracting company expense that, when worn properly, will protect part or all of the body from foreseeable risks of injury or disease in the workplace. Protective clothing shall be worn when performing work assignments in a potentially hazardous work environment or performing work under hazardous conditions. Typical items of protective clothing are protective footwear, headwear, or gloves.

Protective Equipment. A device or item provided to personnel at Government or contracting company expense that, when used correctly, will protect part or all of the body from foreseeable risks of injury or disease in the workplace. Protective equipment shall be utilized when entering or performing work assignments in hazardous work environments or during hazardous conditions. Protective equipment includes hearing protection, eye protection respirators, barricades, warning cones, lights, alarms, full body harnesses, and lanyards.

Qualified Person. One who, by possession of a recognized degree, certificate, or professional standing, or who, by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project.

APPENDIX B. ACRONYMS

ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
COR	Contracting Officer Representative
FC	Facility Coordinator
FSH	Facility Safety Head
LAPD	Langley Policy Directives
LaRC	Langley Research Center
LF	Langley Form
LPR	Langley Procedural Requirements
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
SFAB	Safety and Facility Assurance Branch
SMAO	Safety and Mission Assurance Office

Subject: Noise Control and Hearing Conservation Program

Responsible Office: Safety & Mission Assurance Office

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Change History Log

Revision	Date	Description of Change
Baseline	March 24, 2021	New document

PREFACE

P.1 PURPOSE

a. This NASA Langley Procedural Requirement (LPR) sets forth the procedural requirements and responsibilities for the Langley Research Center (LaRC) Noise Control and Hearing Conservation Program (HCP) under the direction of the Safety and Facility Assurance Branch (SFAB), Safety and Mission Assurance Office (SMAO). It provides specific requirements for protective measures to be taken for personnel who may be exposed to hazardous noise levels.

b. The requirements presented in this LPR implement federal Occupational Safety and Health Administration (OSHA) regulations and NASA management policy for industrial hygiene programs. NASA and contractor management will supplement the provisions of this procedural requirement by implementation of internal policies and instructions, as needed.

P.2 APPLICABILITY

a. This LPR is applicable to all LaRC organizations and all federal civil service personnel on Center.

b. This LPR is applicable to contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, agreements, or grants.

c. Noncompliance with the requirements of this LPR may result in appropriate disciplinary action against civil service personnel or sanctions against contractors in accordance with the terms of their contracts.

d. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term “shall.” The terms “may” denotes a discretionary privilege or permission, “can” denotes statements of possibility or capability, “should” denotes a good practice and is recommended, but not required, “will” denotes expected outcome, and “are/is” denotes descriptive material.

e. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

a. Noise Control Act of 1972, 42 U.S.C. §4901.

b. Occupational Noise Exposure, 29 CFR §1910.95.

c. Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters, 29 CFR pt. 1960.

d. Occupational Safety and Health Programs for Federal Employees, E. O. 12196, 3 CFR 145 (1980).

e. NPR 1800.1, NASA Occupational Health Program Procedures.

P.4 APPLICABLE DOCUMENTS AND FORMS

a. Occupational Noise Exposure, 29 CFR §1910.95.

b. Specifications for Accident Prevention Signs and Tags, 29 CFR §1910.145.

c. NPR 1441.1, NASA Records Management Program Requirements.

d. LMS-CP-4760, Reporting Injuries, Illnesses, and Compensation Claims.

e. LMS-CP-7151, Obtaining Waivers for Langley Management System (LMS) Requirements.

f. ANSI/ASA S1.4/Part 1/IEC 61672-1, American National Standard Electroacoustics – Sound Level Meters – Part 1: Specifications (a nationally adopted international standard).

g. ANSI/ASA S3.6, American National Standard Specification for Audiometers.

h. American Conference of Governmental Industrial Hygienists (ACGIH), TLVs® and BEIs® (latest annual edition).

P.5 MEASUREMENTS/VERIFICATION

None

P.6 CANCELLATION

LPR 2710.1H, dated September 9, 2016

/s/ David F. Young March 24, 2021

Center Deputy Director Date

Distribution: Approved for public release via the Langley Management System; distribution is unlimited.

CHAPTER 6: NOISE AND HEARING CONSERVATION PROGRAM

6.1 INTRODUCTION

6.1.1 Hearing loss due to noise exposure is preventable. Noise-induced hearing loss (NIHL) is a serious threat to people exposed to hazardous noise levels. Loss of hearing can occur from exposure to impulse or impact noise as well as from exposure to steady-state (i.e., continuous/intermittent) noise. NIHL may be temporary or may become permanent through repeated unprotected exposure to intense noise. Initial deterioration of hearing may not be apparent to the individual. By the time the individual is aware of the loss, the impairment may be substantial and irreversible.

6.1.2 The aim of this procedural requirement is to:

a. Minimize noise generated by LaRC operations.

b. Prevent occupational noise-related hearing loss among personnel.

c. Provide a work environment free from hazardous noise.

d. Give priority to engineering procedures to the greatest extent practicable to eliminate, control, or isolate sources of hazardous noise.

6.1.3 Every effort shall be made to ensure that the work environment affords the necessary protection and conservation of LaRC civil service and contractor personnel's hearing.

6.1.4 Preventive efforts shall be taken to conserve the hearing of personnel employed at LaRC by implementing a hearing conservation program (HCP) as addressed in this chapter.

6.1.5 The procedures for implementing the HCP are presented in this chapter and include noise hazard evaluation, application of engineering control measures, use of hearing protection devices, audiometric testing, worker training, and recordkeeping.

6.1.6 These procedural requirements shall be incorporated in any contract under which contractor personnel will be assigned to on-site LaRC hazardous noise or potential hazardous noise areas.

6.1.7 Contractors shall provide and implement their own written noise control and hearing conservation programs.

a. At a minimum, these programs shall be in accordance with the LaRC HCP as described herein.

b. If a contracting company performs work in hazardous noise areas for LaRC, the HCP shall include regular noise dosimetry to determine worker exposure.

c. If exposures exceed the action level of 82 dBA, personnel shall be given annual audiograms, training, and be included in the HCP.

d. As with other mandated safety programs, the HCP and associated records of LaRC contractors shall be subject to audit by the Hearing Conservation Program Officer (HCPO) or designated representative.

6.2 WAIVERS

6.2.1 Requests for waivers to any of the requirements in this LPR shall be processed in accordance with LMS-CP-7151, “Obtaining Waivers for Langley Management System (LMS) Requirements.”

6.3 RESPONSIBILITIES

6.3.1 The Hearing Conservation Program Officer shall:

a. Be an SFAB Certified Industrial Hygienist (CIH).

b. Be appointed by the LaRC Safety Manager or designee.

c. Implement and administer the HCP.

d. Ensure that personnel who work in hazardous noise areas, including supervisors, are instructed, individually or in groups, by qualified personnel concerning health hazards associated with noise exposure, noise control measures, and the HCP requirements.

e. Maintain a current inventory of all hazardous noise areas and noise levels recorded in these areas and provide the information to Facility Safety Heads and supervisors.

f. Work with supervisors on the placement or reassignment of personnel with significant hearing loss based on the recommendation of the LaRC Medical Director.

g. Measure and analyze noise levels to evaluate personnel exposures and recommend appropriate means of controlling exposures that are found to be hazardous.

h. Evaluate potential hazardous noise exposure areas and equipment that are identified through industrial hygiene audits; investigations of complaints; participation in construction design reviews; and reviews of purchase requisitions, contracts, and engineering (i.e., noise abatement) drawings.

i. Conduct a pre-operational survey of each new operation, job, or procedure that has an associated noise hazard potential before normal operations begin.

j. Identify tools and equipment that generate hazardous noise levels.

k. Conduct resurveys as needed to evaluate each hazardous noise or job area in order to maintain master lists of areas that require hearing protection.

l. Review facility plans (i.e., modification and operations) to ensure that adequate attention is being given to noise exposure controls.

m. Maintain survey data relative to noise levels and personnel exposures.

n. Select hearing protection devices to be used and assess the adequacy of all noise control measures.

o. Approve the procurement of hearing protection devices.

p. Conduct an annual review to ensure that personnel hearing protection training is adequate.

q. Ensure Safety and Industrial Health Audits of LaRC facilities include:

(1) Identifying hazardous noise level areas and equipment and providing this information to the HCPO.

(2) Updating the facilities list of personnel assigned to the HCP and supplying the updated list to the LaRC Occupational Health Clinic.

6.3.2 The LaRC Occupational Health Clinic shall:

a. Obtain noise exposure histories, supervise audiometric testing, and evaluate test results of personnel assigned to the HCP.

b. Maintain a registry of personnel working in hazardous noise areas, schedule and conduct appropriate medical examinations, and, if required, refer personnel to an audiologist or an appropriate medical consultant.

c. Notify personnel upon the detection of a significant hearing loss and explain the need for further testing.

(1) Notify personnel's supervisors and the HCPO if further testing substantiates a significant hearing loss.

d. Work with the Langley Human Resources Office, the individual's supervisor, and the Safety and Mission Assurance Office (SMAO) if a change in job assignment is recommended as a result of hearing loss.

e. Ensure that physicians have hearing conservation training and that personnel performing audiometry are certified by the Council for Accreditation for Occupational Hearing Conservation (CAOHC).

Note: Persons who operate microprocessor audiometers do not need to be certified.

f. Ensure that audiometric equipment is calibrated and that ambient noise levels in the test environment permit measurements to 0 dB hearing level.

g. Maintain audiometric test results and other medical records pertinent to the HCP.

h. Provide training at time of audiometric testing to ensure that personnel know the health hazards associated with noise exposure and how to properly don hearing protectors, including molded earplugs, disposable foam inserts, and earmuffs.

6.3.3 Supervisors shall:

a. Report to the HCPO suspected noise hazards in their functional areas.

b. Supply the HCPO and the LaRC Occupational Health Clinic with the names of personnel who may be exposed to noise at or above the action level of 82 dBA, personnel who complain of excessive noise, or who work in an area where it is difficult to understand a normal conversation when the speaker and listener face each other at a distance of three feet.

Note: This is required so that the necessary exposure monitoring, training, hearing protection devices, baseline audiometric examinations, and other needed care or examinations can be provided.

c. Refer all personnel who complain of hearing loss, other hearing complications, or ear problems to the LaRC Occupational Health Clinic for examination.

d. Ensure that personnel who have participated in the HCP medical surveillance program receive a final audiometric examination prior to termination of employment, transfer to duties not involving noise exposures, transfer to another installation, or retirement.

(1) If an annual audiogram has been completed within six months prior to termination, transfer, or retirement date, it may serve as the final audiogram. The supervisor shall email the LaRC Occupational Health Clinic to notify them if this occurs.

(2) If an annual audiogram has been completed more than six months prior to termination, transfer, or retirement date, a final audiogram is required. The supervisor shall request the final audiogram by completing a Langley Form (LF) 66 and writing “EXIT” in the notes section of the form.

e. Ensure personnel keep their appointments at the LaRC Occupational Health Clinic for examination, fitting of hearing protection devices, and hearing conservation training.

f. Enforce the wearing of required hearing protection devices to conserve hearing.

g. Ensure administrative controls are followed.

h. Advise the HCPO of any changes in operations requiring determinations or evaluations of noise levels.

i. Contact the Langley Human Resources Office to ensure any change in job assignment of an individual due to hearing loss is implemented in accordance with applicable policies.

j. Ensure procurement and stocking of appropriate personal protective devices.

k. Obtain HCPO approval prior to the purchase of personal protective devices.

l. Ensure procurement of noise generating equipment that complies with Buy Quiet and Quiet by Design (BQ/QBD) requirements per Section 6.12.

6.3.4 Personnel shall:

a. Wear required hearing protection devices as instructed to conserve hearing.

b. Report hearing loss or hearing/ear problems to their supervisors per LMS-CP-4760.

c. Report changes in noise levels in their facilities to their supervisors.

6.3.4.1 Personnel who are assigned to the HCP shall attend annual appointments at the LaRC Occupational Health Clinic for audiometric testing and hearing protection training.

6.3.5 The Office of Procurement shall:

a. Ensure that procurement of equipment that has the potential to produce hazardous noise levels of 80 dBA and higher shall be conducted in accordance with Section 6.12 of this Chapter.

b. Ensure approval from SFAB for the procurement of new equipment expected to generate noise emission levels approaching the hearing conservation action level of 82 dBA and higher.

6.4 PERSONNEL ASSIGNED TO THE HEARING CONSERVATION PROGRAM

6.4.1 Whenever personnel are occupationally exposed to noise equal to or exceeding the LaRC action level of 82 dBA Time-Weighted Average (TWA) for 30 days or more per year, or can be expected to be exposed to 85 dBA TWA for any one day, they shall be required to participate in the HCP. Exposures will be computed without regard to any attenuation provided by the use of personal protective equipment.

6.4.2 Supervisors shall maintain a list of their personnel who are required to participate in the HCP.

6.5 NOISE HAZARD EVALUATION

6.5.1 Noise hazard evaluation includes identifying hazardous noise areas, personnel working in these areas, and posting signs and decals in those areas.

6.5.2 Noise measurements should be made by industrial hygienists or other personnel who have been trained in noise evaluation techniques whenever any information, observation, or calculation indicates:

a. That personnel may be exposed to noise at or above the action level of 82 dBA;

b. Where personnel complain of excessive noise; or

c. Where it is difficult to understand a normal conversation when the speaker and listener face each other at a distance of three feet.

6.5.3 A noise survey should be conducted with a sound level meter to identify areas and equipment which have noise levels of:

a. 85 dBA or greater for steady and/or intermittent noise.

b. 140 dB peak sound pressure or greater for impact/impulse noise.

6.5.4 Sound level meters should conform, at a minimum, to the requirements for a Type 2 sound level meter as specified in ANSI/ASA S1.4.

6.5.5 Measurements should be taken at the approximate position of the worker's more exposed ear, using the A-weighting and slow meter response for continuous noise and C-weighting for impulse noise. A sufficient number of readings should be taken to account for variations in noise levels.

6.5.6 Acoustic Calibrator:

a. The sound level meter shall be calibrated with the acoustic calibrator, before and after noise measurements, on the day that measurements are to be made.

b. The industrial hygienist using the sound level meter shall maintain a record of these daily calibrations.

c. The acoustic calibrator shall be comprehensively calibrated annually by the factory or factory equivalent. The results of these procedures should be maintained on calibration worksheets.

d. When the equipment is found to be out of calibration, the HCPO shall be notified that corrective actions are being taken.

6.6 HAZARDOUS NOISE AREAS

6.6.1 Industrial hygienists shall conduct noise surveys to identify hazardous noise areas.

6.6.2 Areas shall be resurveyed within 30 days of any modification affecting the noise levels.

6.6.3 Walkthrough inspections shall be conducted during the Annual Safety and Industrial Hygiene Audit or as a separately scheduled survey.

6.6.4 When significant differences from the previous surveys are noted, the area shall be resurveyed.

6.6.5 The results of these surveys shall be recorded by the HCPO.

6.6.6 SFAB shall retain these records for at least 40 years.

6.6.7 Full-shift noise dosimetry shall be performed periodically in facilities with operations where personnel are exposed to noise levels in excess of 75 dBA for extended periods and there is reason to suspect that exposure may approach the LaRC action level of 82 dBA.

6.6.8 Dosimetry for civil servants shall be conducted by the HPCO or designee.

6.6.9 Dosimetry procedures and results shall be reviewed by a CIH.

6.6.10 Contractors shall be responsible for conducting their own noise dosimetry in accordance with LaRC, NASA, ANSI, and OSHA standards.

6.6.11 The HCPO or designee may provide guidance to contractor organizations when requested, but noise dosimetry and worker exposure assessments shall be the responsibility of the contracting company.

6.7 POSTING OF HAZARDOUS NOISE AREAS OR EQUIPMENT

6.7.1 All work areas or equipment that produce sound pressure levels (SPL) of 85 dBA or greater for continuous noise or 140 dBC SPL for impulse/impact noise shall be prominently posted with signs and decals.

6.7.2 Signage visible to personnel entering or working in the area shall be posted at entrances to or on the periphery of hazardous noise areas to alert workers and visitors that a noise hazard exists and that proper precautions should be taken.

6.7.3 Signage shall comply with 29 CFR §1910.145, “Specifications for Accident Prevention Signs and Tags.”

6.7.4 Signage (decals or tags), designed for individual pieces of equipment, shall be affixed to each piece of equipment that produces hazardous noise levels. Exceptions may be made when an entire space is designated as a hazardous noise area and equipment is stationary.

6.7.5 Contact SFAB for sign and decal approval.

6.8 ENGINEERING CONTROL MEASURES

6.8.1 Effective engineering noise controls shall be the primary method used to protect personnel from the hazards of noise.

a. All practical design approaches to reduce levels by acoustical engineering shall be explored and used to reduce steady-state noise levels to below 82 dBA and impulse noise levels to below 140 dBC, or to the maximum extent possible.

b. In each instance where, at the design stage, the known or suspected noise level is expected to exceed current maximum allowable limits, the cognizant project or Facility System Safety Engineer shall document and forward these findings to the HCPO.

c. Corrective action to abate all hazardous noise levels to acceptable levels shall be included in the design.

6.8.2 New equipment being considered for purchase should have the lowest noise emission levels that are technologically and economically feasible and compatible with performance and environmental requirements in accordance with the BQ/QBD requirements in Section 6.12.

6.8.3 Acoustic considerations shall be included in the criteria of plans and specifications for all new facilities, substantial modification projects for facilities, and for aircraft and spacecraft systems and subsystems.

6.9 HEARING PROTECTION DEVICES

6.9.1 Selection of hearing protection devices depends on the noise level, type of noise (i.e., steady-state or impulse), and personnel comfort. Devices include earplugs and earmuffs, which must have a minimum Noise Reduction Rating (NRR) of 27 dB.

6.9.2 Hearing protection devices shall be provided to personnel for voluntary use whenever there is equipment or operations with steady-state noise exposure levels of less than 85 dBA.

6.9.3 Approved hearing protection devices shall be used by all personnel when exposed to steady-state noise levels of 85 dBA or greater. This includes working in designated hazardous noise areas or with hazardous noise producing equipment.

6.9.4 Earplugs shall be worn in combination with earmuffs when personnel work in areas where steady-state noise levels are 110 dBA and above.

6.9.5 A limitation shall also be placed on daily exposure time in areas with steady-state noise levels of 120 dBA (i.e., administrative controls).

6.9.6 Personnel occupancy in areas with steady-state noise levels above 140 dBA shall be avoided regardless of the duration of exposure.

6.9.7 The tradeoff rate between noise level and allowable daily exposure is 3 dBA for every halving of time, as shown in Table A below.

6.9.8 Hearing protection devices, either earplugs or earmuffs, shall be worn when impulse noise levels exceed 140 dBC.

6.9.9 Earplugs shall be worn in combination with earmuffs when personnel work in areas with impulse noise in excess of 165 dBC.

6.9.10 Types of Hearing Protection Devices

6.9.10.1 Protective devices (e.g., earplugs and earmuffs) shall be maintained by each organization and made available to personnel.

6.9.10.2 Contractors shall make hearing protection equipment available to their personnel.

6.9.10.3 Hand-Formed Earplug Inserts (Disposable)

a. Hand-formed earplug inserts do not require medical fitting.

b. Personnel should be instructed on how to use hand-formed earplug inserts.

c. Cutting hand-formed plugs into halves shall not be permitted as this will result in an inadequate mass and markedly reduced noise attenuation.

d. For hygienic reasons, hands should be clean when preparing hand-formed earplugs for insertion.

6.9.10.4 Preformed Earplugs

a. Preformed earplugs (e.g., single and triple flange) should be cleaned with a mild soap and water solution and rinsed thoroughly in between uses.

b. Properly fitted earplugs will not cause damage to the normal ear canal provided the plugs are kept reasonably clean.

6.9.10.5 Earmuffs

a. When earmuffs are used, the headband should be properly adjusted to ensure a snug fit.

b. When eyeglasses are worn with earmuffs, it is important that the ear cup seals of the earmuffs fit well around the temples of the eyeglasses. Even a small "leak" defeats the purpose of wearing earmuffs.

c. Earmuffs should be periodically inspected for torn, punctured, or hardened seals.

d. Damaged units shall be discarded and replaced.

e. Units issued to individuals should be kept clean from dirt or other debris that could cause possible health problems.

6.10 AUDIOMETRIC TESTING AND MEDICAL EVALUATION

Note: Audiometric testing is used to identify the presence of early changes in hearing sensitivity. In combination with a history of all noise exposure, including off-duty noise exposure, audiometry makes it possible to determine if the issued hearing protection is being used and if engineering controls are adequate. It may also be possible to identify individuals who are highly susceptible to noise-induced hearing loss.

6.10.1 Audiometry is a primary element of the HCP.

6.10.2 All monitoring audiometry should comply with OSHA 29 CFR §1910.95 (g), (h), Appendices C, D, and E.

6.10.3 All personnel participating in the HCP shall be required to take pre-certification and termination audiometric testing.

Table B. Noise Exposure Limits (Equivalent Exposures) per ACGIH's TLVs®

Duration (Hours)	dBA
16	82
8	85
4	88
2	91
1	94
0.5	97
0.25	100
0.125 or less	103

6.10.4 Civil servant audiograms shall be provided at the LaRC Occupational Health Clinic.

6.10.5 Contracting companies shall provide audiograms to their personnel by utilizing a qualified vendor that provides audiometric testing services.

6.10.6 All audiometric testing and review shall be performed by personnel certified by the CAOHC.

6.11 TRAINING

6.11.1 Training shall be required for personnel working in, supervising, or managing hazardous noise areas.

6.11.2 All personnel who are assigned to the HCP shall be trained annually regarding the permanent nature of noise-induced hearing loss, type and use of personal protective measures, and the requirements of the HCP.

6.11.2.1 Training shall be performed by the LaRC Occupational Health Clinic at the time of worker audiometric testing.

6.11.3 Symptoms that may be experienced before permanent hearing loss occurs shall be explained and the importance of obtaining early medical/audiometric evaluation of

these symptoms shall be stressed.

6.11.4 The HCPO or other trained individuals shall conduct training for supervisors and managers of personnel in hazardous noise areas, emphasizing their responsibilities in the program.

6.11.5 Contractor personnel shall be trained by their respective employers.

6.11.6 Personnel shall be encouraged to use hearing protection devices whenever they are exposed to hazardous noise during off-duty activities (e.g., from lawn mowers, firearms, and so forth).

6.12 BUY QUIET REQUIREMENTS FOR PROCUREMENT OF NEW EQUIPMENT

6.12.1 When purchasing new equipment expected to generate noise emission levels approaching the hearing conservation action level of 80 dBA and higher, the steps below shall be taken. The objective of these steps is to conduct a cost benefit analysis to ensure the equipment meets realistic noise emission levels at a reasonable cost.

a. Research available products relative to these questions.

(1) What are the typical noise levels for available products?

(2) Is there a product that produces a lower noise level than typical?

(3) What is the price differential for the quieter version?

b. Based on the research, specify realistic noise emission levels that can be purchased at a reasonable cost that will meet required technical specifications. For example, if products can be purchased at a small cost increase that produce noise levels below 80 dBA when most available products have a noise emission above 80 dBA, consider a noise specification of less than 80 dBA. On the other hand, if the lower noise level equipment costs significantly more, the increased cost may not be justified.

6.12.2 Contact the LaRC Safety Office (757) 864-7233 (4-SAFE) for assistance with conducting the steps above.

6.13 RECORDKEEPING

6.13.1 The LaRC Medical Director shall ensure that records pertaining to the HCP are maintained for 40 years.

6.13.2 Records pertaining to the conduct of the HCP shall be maintained in accordance with the guidelines set forth in NPR 1441.1, “NASA Records Management Program Requirements.”

6.13.3 Records relative to disposition of personnel for whom administrative noise controls have been recommended and those who are being carefully monitored, including:

a. Special actions and/or recommendations, which are directed at engineering controls.

b. Data and information concerning the calibration and repair of sound measuring equipment and audiometers.

c. Data and information on audiometric test booths, personnel hearing protectors, and auditory risk criteria.

d. Data and information for use in the education program of personnel exposed in hazardous noise areas.

6.13.4 Records and results of all audiometric examinations and all other pertinent information should also be maintained as a permanent part of the individual's medical record and include:

a. The audiometric test results and training performed for hearing conservation purposes.

b. An occupational noise exposure history and pertinent noise survey data and/or relevant non-occupational noise exposure.

6.13.5 A current Center-wide register of personnel who are enrolled in the HCP should be kept and appropriate entries should be made in the individual's medical record.

APPENDIX A. DEFINITIONS

Action Level. An 8-hour time-weighted average of 82 decibels measured on the A-scale, slow response, or equivalently, a dose of 50 percent. Personnel exposure at or above the action level shall trigger enrollment into the hearing conservation program.

Administrative Controls. Any procedure that limits daily exposure to noise by control of the work schedule.

Audiogram. A record of the threshold of audibility as a function of frequency obtained for each ear during an audiometric examination.

Audiologist. A professional specializing in the study and rehabilitation of hearing, who is certified by the American Speech-Language-Hearing Association (ASHA) or licensed by a state board of examiners.

Audiometer. An electronic instrument that conforms to the requirements and specifications of ANSI/ASA S3.6 used for measuring hearing threshold levels.

Baseline Audiogram. The audiogram against which future audiograms are compared.

Decibel (dB). A unit of measurement of sound level. The decibel level of a sound is related to the logarithm of the ratio of sound pressure to a reference pressure. The dB has meaning only when the reference is known. The internationally accepted reference pressure used in acoustics and at LaRC is 20 micropascals (μPa).

a. **dBA (A-weighted decibels).** A unit of measurement of sound level corrected to the A-weighted scale, as defined in ANSI/ASA S1.4, using a reference of 20 micropascals.

b. **dBC (C-weighted decibels).** A unit of measurement of sound level corrected to the C-weighted scale. The C scale discriminates very little against low frequencies, approximating a uniform response over the frequency range from 25-8,000 Hertz (Hz).

Engineering Control. Any design procedure that reduces the sound level either at the source of the noise or within the hearing zone of the individuals.

Hazardous Noise. This noise consists of the following two types:

a. **Steady-State Noise.** Continuous/intermittent noise equivalent to 85 dBA or greater sound pressure level.

b. **Impulse or Impact Noise.** Sound with a rise time of not more than 35 milliseconds to peak intensity and a duration of not more than 500 milliseconds to the time when the level is 30 dB below the peak. If the impulses recur at intervals of less than one-half second, they will be considered as steady-state noise. Noise equivalent to 140 dB or greater peak sound pressure level (dBP) is considered to be hazardous.

Hearing Threshold Level. The amount, in decibels, by which the threshold of audibility for an ear differs from the standard audiometric level.

Hertz (Hz). The international symbol for cycles per second. It is the unit of measurement for the frequency of tones.

Listening Checks. Preliminary checks of the audiometer, performed by the audiometric technician, to detect noise, distortion, intermittent tones, and other audiometer malfunctions, which would preclude valid testing.

Monitoring Audiogram. Periodic audiometric tests, obtained subsequent to the baseline audiogram, which are used to detect shifts in the individual's threshold of hearing.

Noise Reduction Rating (NRR). A unit of measurement used to determine the effectiveness of hearing protection devices to decrease sound exposure within a given working environment.

Sound Pressure Level. A sound measurement expressed in decibels obtained with a sound level meter that has a flat frequency response (i.e., slow time) equivalent to twenty times the common logarithm of the ratio of the measured A-weighted sound pressure to the standard reference pressure of 20 micropascals measured in decibels.

Sound Level Meter. An electronic instrument, which measures sound levels conforming to the requirements for a Type II sound level meter as specified in ANSI/ASA S1.4.

Time-Weighted Average (TWA). The constant sound level, over an 8-hour workday exposure, which is equivalent to the percent noise exposure as is measured by an audio dosimeter.

APPENDIX B. ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
BQ/QBD	Buy Quiet and Quiet by Design
CFR	Code of Federal Regulations
CAOHC	Council for Accreditation in Occupational Hearing Conservation
CIH	Certified Industrial Hygienist
LPR	Langley Procedural Requirements
LaRC	Langley Research Center
NIHL	Noise-Induced Hearing Loss
NRR	Noise Reduction Rating
HCP	Hearing Conservation Program
HCPO	Hearing Conservation Program Officer
NPR	NASA Procedural Requirements
OSHA	Occupational Safety and Health Administration
SFAB	Safety and Facility Assurance Branch
SMAO	Safety and Mission Assurance Office
SPL	Sound Pressure Level
TLV®	Threshold Limit Values
TWA	Time-weighted average

Subject: Ergonomics Program

Responsible Office: Safety & Mission Assurance Office

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PREFACE

P.1 PURPOSE

a. This Langley Research Center (LaRC) Procedural Requirement (LPR) sets forth the responsibilities and procedures for the LaRC Ergonomics Program.

b. The Ergonomics Program is designed to provide the framework for preventing and managing Musculoskeletal Disorders (MSDs).

P.2 APPLICABILITY

a. This LPR is applicable to all LaRC organizations and all federal civil service personnel on Center.

b. This LPR is applicable to contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, agreements, or grants.

c. It is the responsibility of contractors to provide and implement their own ergonomics programs. As a minimum, these contractor programs shall be in accordance with the LaRC Ergonomics Program as described herein.

d. Noncompliance with the requirements of this LPR may result in appropriate disciplinary action against civil service personnel or sanctions against contractors in accordance with the terms of their contracts.

e. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term “shall.” The terms “may” denotes a discretionary privilege or permission, “can” denotes statements of possibility or capability, “should” denotes a good practice and is recommended, but not required, “will” denotes expected outcome, and “are/is” denotes descriptive material.

f. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

a. NPD 1800.2, NASA Occupational Health Program.

b. NPR 1800.1, NASA Occupational Health Program Procedure.

c. NPR 8715.1, NASA Occupational Safety and Health Programs.

d. NPR 8715.3, NASA General Safety Program Requirements.

P.4 APPLICABLE DOCUMENTS AND FORMS

a. NPR 3713.1, Reasonable Accommodations Procedures for Individuals with Disabilities.

b. LMS-CP-7151, Obtaining Waivers for Langley Management System (LMS) Requirements.

c. LMS-CP-4760, Reporting Injuries, Illnesses, and Compensation Claims.

d. LMS-CP-3713, Reasonable Accommodations for Individuals with Disabilities.

e. LF 19, Office Ergonomics Evaluation Checklist.

P.5 MEASUREMENTS/VERIFICATION

Langley Form 19 is used to gather data for determining compliance in assessing worksites and in coordinating with LaRC Occupational Health Clinic personnel.

P.6 CANCELLATION

LPR 1820.2C, dated June 20, 2017

/s/ David F. Young March 24, 2021

Center Deputy Director Date

Distribution: Approved for public release via the Langley Management System; distribution is unlimited.

CHAPTER 7: ERGONOMICS PROGRAM

7.1 INTRODUCTION

7.1.1 Every effort shall be made to ensure that the work environment affords the necessary protection against musculoskeletal disorders (MSDs). MSDs may develop in workers whose jobs involve repetitive motions, force, awkward postures, contact stress, cold temperatures, excessive duration, and vibration.

7.1.2 The principle behind ergonomics is that by fitting the job to the worker through adjusting the workstation, rotating between jobs, taking frequent breaks, or using mechanical assistive devices, MSDs can be reduced and ultimately eliminated.

7.1.3 Ergonomic-related injuries are usually associated with prolonged exposure to inappropriate work conditions or practices rather than acute exposure injuries such as sprains and strains.

7.1.4 The aim of this procedural requirement is to:

a. Identify work practices and operations that may lead to MSDs.

b. Prevent MSDs among personnel.

c. Provide a work environment free from ergonomic hazards.

d. Give priority to engineering and administrative controls to the greatest extent practicable to eliminate or control work operations that may lead to the development of MSDs.

7.1.5 The requirements of this LPR shall be incorporated into any contract under which contractor personnel will be assigned to on-site LaRC activities that may lead to the development of MSDs.

7.2 WAIVERS

7.2.1 Requests for waivers to any of the requirements in this LPR shall be processed in accordance with LMS-CP-7151, “Obtaining Waivers for Langley Management System (LMS) Requirements.”

7.3 RESPONSIBILITIES

7.3.1 The Safety and Facility Assurance Branch (SFAB) Ergonomics Program Manager shall:

a. Implement and administer the LaRC Ergonomics Program.

b. Evaluate levels of personnel exposure to ergonomic hazards and recommend means of controlling exposures.

c. Ensure that personnel are instructed, individually or in groups, by knowledgeable personnel concerning the health hazards associated with repetitive motions, force, awkward postures, contact stress, cold temperatures, excessive duration, and vibration, as well as methods to mitigate them.

d. Maintain survey data relative to MSD hazards and employee exposures.

e. Conduct an annual review of the Ergonomics Program and implement changes to ensure coverage of all potential ergonomic hazards.

f. Conferring with the supervisor, the Langley Human Resources Office (HRO), and the LaRC Medical Director about placement or reassignment of personnel when notification concerning an individual with a significant MSD is received from the LaRC Occupational Health Clinic. Requests for reasonable accommodations will be addressed via provisions in NPR 3713.1, “Reasonable Accommodations Procedures for Individuals with Disabilities,” and LMS-CP-3713, “Reasonable Accommodations for Individuals with Disabilities.”

g. Ensure ergonomics consultative services are provided to Center personnel.

h. Ensure worksite evaluations are scheduled and conducted.

i. Ensure personnel’s supervisors are notified if a significant change in workstation layout is recommended.

j. Conduct follow-up evaluations for personnel who have reported to the LaRC Occupational Health Clinic for MSDs and for personnel who have modifications made to their workplace in response to an MSD complaint.

k. Review LaRC injury information to determine trends in ergonomic injuries.

7.3.2 The Occupational Health Clinic shall:

a. Obtain work histories in support of the Ergonomics Program, and evaluate test results.

b. Schedule and conduct appropriate medical examinations, and/or refer personnel to an appropriate medical consultant.

c. Notify personnel’s supervisors if a change in job assignment or workstation layout is recommended as a result of an MSD.

d. Notify and coordinate with the Ergonomics Program Manager when an individual reports to the Clinic with an MSD.

7.3.3 Supervisors shall:

a. Refer personnel who have a potential MSD to the LaRC Occupational Health Clinic for examination.

b. Ensure that personnel report any potential MSD to the LaRC Occupational Health Clinic.

c. Review personnel work activities and identify tasks or locations that may pose an MSD risk.

d. Ensure controls are implemented for identified MSD hazards.

e. Ensure the procurement (including credit card purchases) of appropriate ergonomic related protective equipment and other ergonomic devices by obtaining the approval of the Ergonomics Program Manager.

f. Notify the Ergonomics Program Manager of new or previously un-reviewed work activities that are likely to result in MSDs so that ergonomic assessments can be made.

g. Ensure personnel are aware of ergonomic hazards in their work areas that could result in an MSD. Supervisors should request assistance from the Ergonomics

Program Manager if they are unsure if ergonomic hazards are present in their work areas.

7.3.4 Personnel shall:

a. Notify their supervisors or the Ergonomics Program Manager of activities that may present a risk for MSDs.

b. Report to the LaRC Occupational Health Clinic for evaluation if they believe they may be experiencing symptoms of an MSD per LMS-CP-4760.

c. Perform work using good ergonomic practices and request assistance from the Ergonomics Program Manager if they are unsure of proper workstation setup or good ergonomic work practices.

7.4 GUIDANCE

7.4.1 The recommendations for implementing the Ergonomics Program are presented in this chapter. The recommendations include training of supervisors and employees regarding common MSDs and their signs/symptoms, evaluating employee workstations for ergonomic hazards, use of ergonomic devices to reduce the likelihood and severity of MSDs, and recordkeeping.

7.4.2 MSD Hazard Evaluation

7.4.2.1 MSD hazard evaluation includes identifying workstation layout and work practices which are likely to result in MSDs.

7.4.3 Work Station Evaluations

7.4.3.1 Personnel who are experiencing discomfort or concern about workstation setup may request an evaluation. Evaluations may also be requested by supervisors or by the LaRC Occupational Health Clinic in response to a suspected MSD. Workstation evaluations are performed by the Ergonomics Program Manager or a knowledgeable designated representative.

7.4.3.2 Copies of the results of evaluations, along with the recommended actions, shall be distributed to the individual, the supervisor, the LaRC Occupational Health Clinic, and the Ergonomics Program Manager.

7.4.3.3 Personnel are also encouraged to perform evaluations of their own workstations using Langley Form (LF) 19.

7.5 OFFICE ENVIRONMENTS

7.5.1 MSD-related injuries in the office environment are most often associated with poor workstation arrangement and excessive computer usage without taking breaks. These injuries can be prevented through proper workstation design and the use of micro-breaks.

7.5.2 Engineering Controls

7.5.2.1 In office environments, the primary method of control is the selection of appropriate furniture and the proper position of the furniture and office equipment in relation to the worker.

7.5.2.2 The following provides considerations for the selection and use of office equipment:

a. Chairs:

(1) Chairs should be highly adjustable, allowing adjustment of the following: seat height and tilt, armrest height and width, and backrest height or lumbar support height.

(2) Wheeled office chairs shall have a five-point star base.

(3) Existing chairs shall be used until unserviceable unless there are indications that their use will lead to an MSD or their condition (e.g., tipping, balance) poses the potential for other injury.

(4) When purchasing chairs, the chair selected should be fitted to the individual who will be using it.

(5) Chairs being purchased to address ergonomic concerns should have good lumbar support and wheels appropriate for the floor surface.

b. Work Surfaces:

(1) Work surfaces should be of a height such that the worker's forearms are roughly parallel to the floor and deep enough to accommodate all necessary equipment such as monitors and keyboards.

(2) The working position should not require the worker's forearms or wrists to contact any sharp corners.

(3) Articulated keyboard trays can be used to provide adjustability to workstations.

(4) An adjustable height desk can provide the worker with the flexibility to sit or stand when desired and still be able to be productive.

c. Lighting:

(1) Room lighting should be bright enough to prevent eyestrain.

(2) Individual bulbs may be removed from overhead lights to control lighting intensity and glare.

(3) The use of task lighting is effective for creating areas of localized lighting without increasing the overall brightness of a room.

7.5.2.3 When non-standard ergonomic furniture (e.g., ergonomic chair, adjustable height desk) is needed, and the cost is less than $750:

a. Personnel shall notify their supervisors of their concerns.

b. Personnel shall request an ergonomic evaluation from the Ergonomics Program Manager.

Note: SFAB maintains a pre-approved list of ergonomic furniture. If personnel select from the pre-approved list, an ergonomic evaluation may not be required.

7.5.2.4 When non-standard ergonomic furniture (e.g., ergonomic chair, adjustable height desk) is needed, and the cost exceeds $750, additional justification is required

before the furniture can be approved. The process for initiating the justification is as follows:

a. The individual shall notify their supervisors of their concerns.

b. The individual shall obtain medical documentation, either from the LaRC Occupational Health Clinic or from a private physician, to determine if the conditions warrant the purchase of the furniture.

c. The medical documentation shall be provided to the LaRC Occupational Health Clinic for retention in the individual's medical file. Medical documentation may be required if it is determined by the individual's supervisor and the Ergonomics Program Manager that furniture exceeding $750 is necessary for the individual to perform their duties.

d. Personnel shall request an ergonomic evaluation from the Ergonomics Program Manager.

7.5.3 Administrative Controls

7.5.3.1 Administrative control measures include:

a. Breaks. Taking frequent breaks is perhaps one of the easiest ways to prevent injuries associated with prolonged computer usage. A break for the whole body of a few minutes should be taken frequently (e.g., five minutes every hour). Studies have shown that it is effective in preventing injury and that productivity and accuracy are actually improved as a result of frequent breaks. Frequent micro-breaks for the eyes are also recommended (e.g., for every 20 minutes of computer usage, look at least 20 feet away for twenty seconds).

7.6 INDUSTRIAL ENVIRONMENTS

7.6.1 Musculoskeletal injuries in industrial environments can occur from improper lifting and material movement techniques, from performing repetitive tasks, and from using hand tools. As each industrial environment is unique, only general guidance can be provided regarding evaluation of these types of worksites.

7.6.2 Engineering Controls

7.6.2.1 The primary engineering controls for an industrial setting are the use of proper material handling equipment and design of work areas to prevent awkward or stressful positions or motions. The selection of ergonomically designed hand tools is also important.

7.6.2.2 Material Handling

7.6.2.2.1 The selection of proper handling equipment can be complex and should be made in consultation with knowledgeable personnel. Situations in which material-handling aids should be considered include the movement of large, heavy, or awkwardly shaped items and work environments where employees repeatedly perform lifts.

7.6.2.2.2 Common material handling equipment includes pallet jacks, pump-jack tables, and mechanical lifting aids, such as vacuum lift assist devices.

7.6.2.3 Work Area Design

7.6.2.3.1 When designing industrial work areas, the types of tasks to be performed should be considered. Shelves and parts bins should be placed at heights that keep loads at the proper working height and do not require excessive reaching, and the active working area should be directly in front of the worker.

7.6.2.3.2 Work surfaces, such as benches, should also be kept at heights consistent with the working position of the worker (e.g., sitting or standing). Standing work locations should have floor mats and stools to increase worker comfort.

7.6.2.4 Tool Selection

7.6.2.4.1 Selecting appropriate hand tools can greatly increase worker comfort and prevent injuries associated with gripping small objects. Tool handles should allow workers to keep a neutral wrist position during use and be large enough to grip comfortably. Hand tools should be well balanced to reduce the amount of torque on the wrist. Tools with finger grooves molded into them should not be used; there is no standard hand or finger size and these tools are likely to cause unnecessary pressure from the grooves.

7.6.2.4.2 Vibrating power tools have the ability to cause nerve injury. Whenever possible, tools with built-in vibration dampeners should be selected. Tool handles should be comfortable to grip and padded when possible.

7.6.3 Administrative Controls

a. When purchasing chairs, the chair selected should be fitted to the individual who will be using it. Chairs should be highly adjustable, per Paragraph 7.4.1.2.

b. When lifting objects, care should be taken to use proper lifting techniques in order to avoid back injuries. More than one person should lift objects that weigh more than 40 pounds, are large, or are awkwardly shaped.

c. Lifting and repetitive tasks should be rotated among personnel.

d. The use of protective equipment, such as back braces or lifting belts, is not recommended by the National Institute for Occupational Safety and Health (NIOSH) and should not be used unless recommended by a medical professional.

7.7 RECORDKEEPING

7.7.1 Records of workstation evaluations (i.e., LF 19) shall be retained in personnel's medical files at the LaRC Occupational Health Clinic.

APPENDIX A. DEFINITIONS

Duration. The length of any period of work activity which poses a MSD risk. The longer the duration of a task, the greater the exposure and risk of an MSD.

Ergonomics. The application of knowledge about human capacities and limitations to the design of workplaces, jobs, tasks, tools, equipment, and the environment.

Frequency. The rate at which specific physical motions or exertions are repeated.

Musculoskeletal Disorders (MSDs). Disorders caused by improper job, tool, and workstation design, by application of excessive force on the body, or by unusual postures. In general, the term MSD applies only to injuries received from chronic exposure rather than to acute injuries such as strains and sprains. Other terms commonly associated with MSD are Cumulative Trauma Disorder (CTD) and Repetitive Stress Injury (RSI).

Posture. The position of any part of the body during a work activity. Neutral postures are important because they maximize the amount of strength a worker can exert, maximize comfort, and minimize the risk of injury.

Repetition. Repetition or use of the same body parts continuously throughout the workday is damaging to the body. Micro-traumas from repetition can result in inflammation of the tendons, muscle irritation or entrapment syndromes, and nerve irritation. Prolonged exposure to repetitive motions can result in even more traumatic injuries.

APPENDIX B. ACRONYMS

HRO	Human Resources Office
LaRC	NASA Langley Research Center
LPR	Langley Procedural Requirements
MSD	Musculoskeletal disorder
NIOSH	National Institute for Occupational Safety and Health
SFAB	Safety and Facility Assurance Branch

Subject: Asbestos Management Program

Responsible Office: Safety & Mission Assurance Office

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Baseline	March 24, 2021	New document

PREFACE

P.1 PURPOSE

a. This chapter establishes minimum requirements for the handling, maintenance, use, removal, and disposal of all friable and non-friable asbestos-containing materials (ACMs), ACM debris, and presumed asbestos-containing materials (PACMs) at NASA Langley Research Center (LaRC).

b. The objective of the LaRC Asbestos Management Program is to prevent personnel exposure to asbestos fibers and ensure that asbestos materials can be managed in place safely until they are abated during maintenance, renovation, or demolition activities.

P.2 APPLICABILITY

a. This Langley Procedural Requirement (LPR) is applicable to all LaRC organizations and all federal civil service personnel on Center.

b. This LPR is applicable to contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, agreements, or grants.

c. Noncompliance with the requirements of this LPR may result in appropriate disciplinary action against civil service personnel or sanctions against contractors in accordance with the terms of their contracts.

d. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term “shall.” The terms “may” denotes a discretionary privilege or permission, “can” denotes statements of possibility or capability, “should” denotes a good practice and is recommended, but not required, “will” denotes expected outcome, and “are/is” denotes descriptive material.

e. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

a. NPR 1800.1, NASA Occupational Health Program Procedures.

b. Asbestos, 29 CFR §1910.1001.

c. Asbestos, 29 CFR §1926.1101.

d. National Emission Standard for Asbestos, 40 CFR pt. 61, Subpart M.

e. American Conference of Governmental Industrial Hygienists (ACGIH), TLVs® and BEIs® (latest annual edition).

P.4 APPLICABLE DOCUMENTS AND FORMS

a. LPR 8500.1, Environmental and Energy Program Manual.

b. LMS-CP-7151, Obtaining Waivers for Langley Management System (LMS) Requirements.

c. LF 27, NASA LaRC Asbestos Safety Permit.

P.5 MEASUREMENTS/VERIFICATION

The Asbestos Management Program is audited by NASA's Office of the Chief Health and Medical Officer (OCHMO) during their triennial audit.

P.6 CANCELLATION

None

/s/ David F. Young March 24, 2021

Center Deputy Director Date

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CHAPTER 8: ASBESTOS MANAGEMENT PROGRAM

8.1 INTRODUCTION

8.1.1 While there are still numerous asbestos-containing materials at NASA LaRC, all of the friable ceiling insulation has been abated. The majority of asbestos present at LaRC is thermal system insulation on piping/ducts, floor tile and mastic (some of which is below carpeting), and transite (i.e., asbestos cement) panels.

8.1.2 There are numerous regulations pertaining to the management of asbestos-containing materials. The procedures in this section are intended to describe the methods and procedures utilized at LaRC to comply with these regulations and minimize exposure to workers and the environment.

8.2 WAIVERS

8.2.1 Requests for waivers to any of the requirements in this LPR shall be processed in accordance with LMS-CP-7151, “Obtaining Waivers for Langley Management System (LMS) Requirements.”

8.3 RESPONSIBILITIES

8.3.1 The Safety and Facility Assurance Branch (SFAB) Lead Certified Industrial Hygienist (CIH) shall:

a. Provide guidance on the requirements of federal, state, and local occupational health regulations.

b. Oversee the LaRC Asbestos Management Program.

c. Ensure that personnel and the environment are protected from uncontrolled asbestos fiber release and that appropriate control measures are in place during abatement projects.

d. Ensure that only properly trained and accredited personnel perform asbestos inspection/sampling, project design, visual inspection, and clearance monitoring.

e. Ensure that asbestos awareness training is provided when needed.

f. Ensure that all abatement projects have an approved Langley Form (LF) 27, “NASA LaRC Asbestos Safety Permit,” or abatement plan prior to their start.

8.3.2 The LaRC Occupational Health Clinic shall:

a. Maintain a medical surveillance program for civil service and on-site contractor personnel exposed to asbestos as part of their job responsibilities.

b. Maintain asbestos related medical records in accordance with Occupational Safety and Health Administration (OSHA) requirements.

c. Notify the SFAB Lead CIH when asbestos exposure concerns are brought to their attention.

8.3.3 The Facility Safety Heads (FSH) and Facility Coordinators (FC) shall:

a. Notify the SFAB Lead CIH when maintenance activities in their facilities will involve the disturbance of suspect asbestos-containing building materials (ACBMs).

b. Assist the SFAB Lead CIH by providing pertinent information on building layout and activities and by providing access to required areas within the building during asbestos surveys and inspections.

c. Assist the SFAB Lead CIH in distributing information to occupants in their facilities.

d. Notify the SFAB Lead CIH when asbestos concerns are brought to their attention.

8.3.4 The Center Operations Directorate (COD) shall:

a. Consult with the SFAB Lead CIH during the planning of any construction or maintenance activities that may involve asbestos-containing building materials (ACBMs).

b. Ensure that the NASA LaRC asbestos removal requirements in SPECINTAC are included in the specification package.

c. Ensure that bid specifications identify ACBMs that may be disturbed during renovation and maintenance activities.

d. Ensure that contractor submittals include a site-specific asbestos abatement plan.

e. Ensure that an asbestos safety permit (LF 27) is submitted for any NASA-contracted asbestos work.

8.3.5 Center Maintenance and Operations Contractor (CMOE) shall:

a. Consult with the SFAB Lead CIH prior to beginning any construction or maintenance activities that may involve asbestos-containing materials (ACMs).

b. Provide the SFAB Lead CIH results of any asbestos samples collected by contractors (including CMOE maintenance trades and outside contractors performing work).

c. Ensure that an asbestos safety permit (LF 27) is submitted to the SFAB Lead CIH prior to start of asbestos removal.

d. Ensure that CMOE maintenance personnel have annual asbestos awareness training.

8.3.6 COD’s Environmental Management Office (EMO) shall:

a. Provide guidance and oversight on the disposal of ACMs.

b. Serve as the point of contact with U.S. Environmental Protection Agency (EPA) for asbestos-related matters.

8.3.7 Supervisors shall:

a. Contact the SFAB Lead CIH for an exposure assessment whenever their personnel will be working with ACMs.

b. Contact the SFAB Lead CIH if their personnel report concerns of asbestos exposure or the presence of damaged ACMs.

8.3.8 Personnel shall:

a. Properly use the engineering controls, work practice controls, and personal protective equipment (PPE) specified for any tasks where they may encounter ACMs.

b. Report any damaged ACMs encountered to their supervisors.

8.4 ASBESTOS ABATEMENT

8.4.1 An asbestos safety permit (LF 27) shall be completed for all work that will disturb ACMs.

8.4.2 OSHA Class I abatement projects (friable materials) and Class II abatement projects on building interiors (non-friable materials) shall be performed by EPA-accredited and Virginia state licensed asbestos personnel.

8.4.3 Class II abatement projects on building exteriors (non-friable transite panels and roofing) may be performed by asbestos-trained personnel under the direction of an EPA-accredited and Virginia state licensed asbestos supervisors.

8.4.4 For large scale Class I abatement projects, an Asbestos Operational Procedure per SPECINTAC requirements shall be submitted to the SFAB Lead CIH in addition to the LF 27.

8.4.5 A Safety Data Sheet for solvent used for the abatement of floor tile mastic shall be reviewed and approved by the SFAB Lead CIH.

8.4.5.1 “No-odor/non-volatile” solvents shall not be used due to the reaction that they have with the mastic.

8.4.6 Visual inspection for completeness of removal and abatement following all Class I and II abatement projects shall be performed under the direction of the SFAB Lead CIH.

8.5 ASBESTOS BULK SAMPLING

8.5.1 Asbestos bulk sampling performed at LaRC shall be performed by an EPA-accredited and Virginia state licensed asbestos inspector or a CIH.

8.5.2 Samples shall be collected in accordance with EPA and OSHA Standards.

8.5.3 Samples shall be analyzed by an American Industrial Hygiene Association (AIHA) accredited laboratory.

8.5.4 Results of any samples collected by groups other than SFAB shall be submitted to the SFAB Lead CIH for review.

8.6 ASBESTOS AIR SAMPLING

8.6.1 Asbestos air sampling performed at LaRC shall be performed by an EPA-accredited and Virginia state licensed asbestos project monitor or a CIH.

8.6.2 Samples shall be collected in accordance with EPA and OSHA Standards.

8.6.3 Samples shall be analyzed by an AIHA-accredited laboratory.

8.6.4 Results of any samples collected by groups other than SFAB shall be submitted to the SFAB Lead CIH for review.

8.7 ASBESTOS AWARENESS TRAINING

8.7.1 All personnel performing maintenance, renovation, or custodial work in areas where friable asbestos is subject to disturbance shall receive asbestos awareness training.

8.7.1.1 For civil service personnel, this training shall be provided by SFAB.

8.7.1.2 For contractor personnel, the training shall be provided by their contracting company.

8.8 HYGIENE PRACTICES

8.8.1 The following hygiene practices shall be followed:

a. No food or beverages, tobacco products, or cosmetic applications shall be present in asbestos work areas.

b. Hands shall be washed immediately at the end of shift and before eating, drinking, using tobacco, or applying cosmetics.

c. No protective clothing shall be taken from the work site.

8.9 POSTING OF ASBESTOS SIGNS

8.9.1 All mechanical rooms and spaces with ACMs shall be posted with the following sign:

Figure 8-1. Asbestos Danger Sign.

8.9.2 Warning signs shall be posted in each work area where asbestos abatement is being conducted. The wording on the signs shall include:

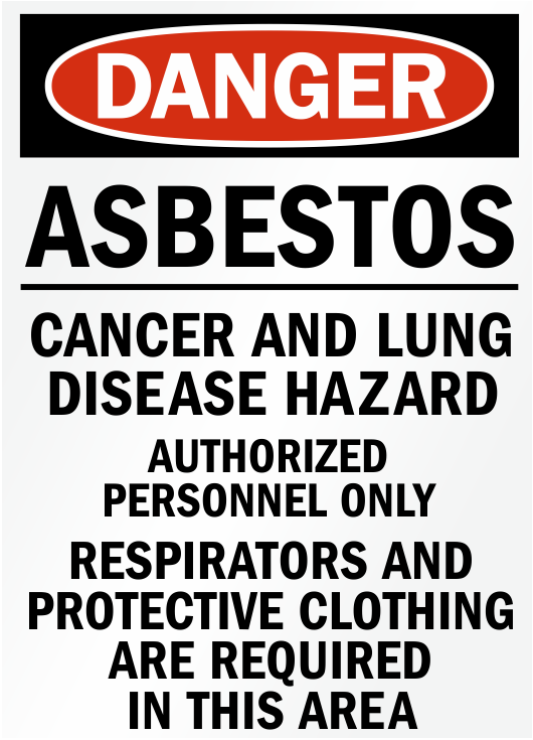

Figure 8-2. Asbestos Danger Sign for Abatement Work Site.

8.10 DISPOSAL

8.10.1 Disposal of any ACMs shall be in accordance with LPR 8500.1.

8.10.2 EMO representatives shall be contacted for assistance on waste manifesting and proper disposal.

8.11 RECORDKEEPING

8.11.1 SFAB shall maintain the following records:

a. Completed asbestos safety permits (LF 27s),

b. Bulk sampling data,

c. Air monitoring data, and

d. Hazard Assessments.

Appendix A. Definitions

Asbestos-Containing Material (ACM). Any material containing more than 1% asbestos.

Certified Industrial Hygienist (CIH). One certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

Industrial Hygienist. A professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational health hazards.

Personal Protective Equipment (PPE). Specialized clothing or equipment worn or used by an individual for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts, or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

Presumed Asbestos-Containing Material (PACM). Thermal system insulation and surfacing material found in buildings constructed no later than 1980.

Appendix B. Acronyms

ACBM	Asbestos-Containing Building Material
ACM	Asbestos-Containing Material
AIHA	American Industrial Hygiene Association
CIH	Certified Industrial Hygienist
CMOE	Center Maintenance and Operations Contractor
COD	Center Operations Directorate
FC	Facility Coordinator
FSH	Facility Safety Head
EMO	Environmental Management Office
EPA	Environmental Protection Agency
LaRC	NASA Langley Research Center
LF	Langley Form
LPR	Langley Procedural Requirements
OCHMO	Office of the Chief Health and Medical Officer
OSHA	Occupational Safety and Health Administration
PACM	Presumed Asbestos-Containing Material
PPE	Personal Protective Equipment
SFAB	Safety and Facility Assurance Branch
SMAO	Safety and Mission Assurance Office

Subject: Lead Management Program

Responsible Office: Safety & Mission Assurance Office

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PREFACE

P.1 PURPOSE

a. This chapter establishes minimum requirements for handling, use, removal, and disposal of all lead-containing materials at NASA Langley Research Center (LaRC).

b. The objective of the LaRC Lead Management Program is to prevent personnel exposure to harmful amounts of lead. It is intended to protect personnel from the immediate toxic effects of acute lead exposure, as well as from the serious toxic effects from chronic exposures that may not be immediately apparent.

P.2 APPLICABILITY

a. This Langley Procedural Requirement (LPR) is applicable to all LaRC organizations and all federal civil service personnel on Center.

b. This LPR is applicable to contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, agreements, or grants.

c. Noncompliance with the requirements of this LPR may result in appropriate disciplinary action against civil service personnel or sanctions against contractors in accordance with the terms of their contracts.

d. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term “shall.” The terms “may” denotes a discretionary privilege or permission, “can” denotes statements of possibility or capability, “should” denotes a good practice and is recommended, but not required, “will” denotes expected outcome, and “are/is” denotes descriptive material.

e. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

a. NPR 1800.1, NASA Occupational Health Program Procedures.

b. Lead, 29 CFR §1910.1025.

c. Lead, 29 CFR §1926.62.

d. American Conference of Governmental Industrial Hygienists (ACGIH), TLVs® and BEIs® (latest annual edition).

P.4 APPLICABLE DOCUMENTS AND FORMS

a. LPR 1710.12, Potentially Hazardous Materials – Hazard Communication Standard.

b. LPR 8500.1, Environmental and Energy Program Manual.

c. LMS-CP-7151, Obtaining Waivers for Langley Management System (LMS) Requirements.

d. LF 622, Safety Permit for Lead Work.

P.5 MEASUREMENTS/VERIFICATION

The Lead Management Program is audited by NASA's Office of the Chief Health and Medical Officer (OCHMO) during their triennial audit.

P.6 CANCELLATION

None

/s/ David F. Young March 24, 2021

Center Deputy Director Date

Distribution: Approved for public release via the Langley Management System; distribution is unlimited.

CHAPTER 9: LEAD MANAGEMENT PROGRAM

9.1 INTRODUCTION

9.1.1 Personnel at NASA Langley Research Center (LaRC) may be exposed to lead through construction and maintenance activities that disturb lead-based paints (LBPs) or other lead-containing building materials. Exposures may also occur where lead-containing products are used, including welding and brazing operations and certain research operations. Good housekeeping and personal hygiene practices are required in these operations to minimize lead exposure. Local exhaust ventilation may be needed to control exposure to other contaminants generated by these operations and to minimize lead exposures during grinding and polishing operations.

9.1.2 As extremely high exposures to lead can occur during welding, cutting, and brazing operations, and abrasive blasting or grinding of lead-containing materials, controls shall be used to protect workers and to prevent lead contamination of the work area.

9.1.3 Environmental regulations require controlling and permitting releases of lead to the air and water, testing of lead-containing materials before disposal, and proper disposal of any lead-containing materials meeting the definition of hazardous waste. See LPR 8500.1, “Environmental and Energy Program Manual,” for information regarding disposal of lead-containing wastes.

9.1.4 Onsite support service contractors and construction contractors are responsible for developing and implementing their own lead compliance programs in accordance with Occupational Safety and Health Administration (OSHA) and NASA requirements.

9.2 WAIVERS

9.2.1 Requests for waivers to any of the requirements in this LPR shall be processed in accordance with LMS-CP-7151, “Obtaining Waivers for Langley Management System (LMS) Requirements.”

9.3 RESPONSIBILITIES

9.3.1 The Safety and Facility Assurance Branch (SFAB) Lead Certified Industrial Hygienist (CIH) shall:

a. Provide guidance on the requirements of federal, state, and local occupational health regulations.

b. Evaluate potential lead exposures to civil service personnel.

c. Recommend procedures to minimize exposures.

d. Recommend personnel for inclusion in the lead worker medical surveillance program.

9.3.2 The LaRC Occupational Health Clinic shall:

a. Maintain a medical surveillance program for civil service and contractor personnel exposed to lead at or above the OSHA Action Level (AL).

b. Notify the SFAB CIH about personnel who may require an exposure evaluation and/or locations that may require environmental evaluation and assessment based on clinical findings that may indicate lead exposure.

c. Notify the SFAB CIH when lead concerns are brought to their attention.

9.3.3 Facility Safety Heads (FSH) and Facility Coordinators (FC) shall:

a. Notify the SFAB CIH when maintenance activities in their facility will involve the disturbance of painted surfaces or lead-containing components.

b. Assist the SFAB CIH by providing pertinent information on building layout and activities and by providing access to required areas within the building during lead-based paint surveys and hazard assessments.

c. Assist the SFAB CIH in distributing information to occupants in their facilities.

d. Notify the SFAB CIH when lead concerns are brought to their attention.

9.3.4 The Center Operations Directorate (COD) shall:

a. Consult with the SFAB CIH prior to beginning any construction or maintenance activities that may involve lead or lead-based paints or coatings.

b. Ensure that bid specifications identify lead or lead components that may be disturbed in any renovation or maintenance activities and include requirements that the contractor comply with all applicable regulations and this instruction.

c. Ensure that the contractor submittals include a site-specific health and safety plan that meets all of the requirements of the OSHA lead standards (e.g., 29 CFR §1910.1025 and 29 CFR §1926.62).

d. Ensure that an LF 622, “Safety Permit for Lead Work,” is submitted for any NASA-directed lead work.

9.3.5 The Center Maintenance and Operations Contractor (CMOE) shall:

a. Consult with the SFAB CIH prior to beginning any construction or maintenance activities that may involve lead or lead-based paints or coatings.

b. Provide the results of any laboratory samples collected to determine if materials or coatings contain lead.

c. Ensure that an LF 622 is submitted for any CMOE-directed lead work.

d. Ensure that lead-related work performed by subcontractors is performed in accordance with the contractor’s site-specific health and safety plan, all applicable regulations, and SFAB CIH guidance.

9.3.6 COD’s Environmental Management Office (EMO) shall:

a. Provide guidance and oversight on the disposal of lead-containing materials.

b. Provide guidance and oversight of lead-contaminated soils.

9.3.7 Supervisors shall:

a. Contact the SFAB CIH for an exposure assessment whenever their personnel will be working with lead or lead-based paint.

b. Ensure their personnel properly implement any engineering or work practice controls recommended by the SFAB CIH.

c. Ensure their personnel properly use any required personal protective equipment (PPE).

9.3.8 Personnel shall:

a. Properly use the engineering controls, work practice controls, and PPE specified for their tasks.

9.4 LEAD ABATEMENT

9.4.1 The SFAB CIH shall be contacted prior to any activities that will disturb a painted surface or component so that a lead-based paint survey can be conducted. Although a paint may be determined by analytical testing not to be an LBP (<600 ppm), the paint may still provide a significant exposure risk if it is disturbed.

9.4.2 Hand scraping and/or sweeping of loose or flaking paint chips for general housekeeping may be performed without additional controls.

9.4.3 However, if painted surfaces will be disturbed by any activity with the potential to release significant amounts of lead fume or dust (e.g., sanding, grinding, or abrasive blasting and cutting), an LF 622 shall be completed and approved prior to the beginning of the activity.

9.5 WELDING, BRAZING AND SOLDERING

9.5.1 Welding and brazing on painted surfaces or using leaded filler materials can release significant amounts of lead fume.

9.5.2 To minimize the potential for exposure, all painted surfaces will be abated at least 4 inches on either side of any weld or cutline. This includes the inside and outside of any vessel or piece of equipment that is painted on both sides.

9.5.3 Airborne lead exposures are usually not a problem during soldering operations when the temperature remains below 450°C (840°F). However, good housekeeping and personal hygiene practices are required in these operations to minimize the potential for the ingestion of lead.

9.6 HANDLING OF LEAD AND LEAD WEIGHTS

9.6.1 Lead sheets, ingots, and weights shall be painted or otherwise sealed to minimize the generation of lead dust.

9.6.2 Storage areas and bins shall be properly labeled.

9.6.3 Good housekeeping and personal hygiene practices are required to minimize the potential for the ingestion of lead.

9.7 USE OF LEAD IN RESEARCH ACTIVITIES

9.7.1 The use of lead in research can require a Potentially Hazardous Material (PHM) permit. PHM permits are covered in more detail in LPR 1710.12, “Potentially Hazardous Materials – Hazard Communication Standard.”

9.8 HOUSEKEEPING

9.8.1 All surfaces in lead work areas shall be maintained free of lead dust accumulation.

9.8.2 Surfaces shall be cleaned using a high-efficiency particulate air (HEPA) vacuum or wet wipes. The use of compressed air to remove lead from dusty surfaces is prohibited.

9.9 HYGIENE PRACTICES

9.9.1 The following hygiene practices shall be followed:

a. No food or beverages, tobacco products, or cosmetic applications shall be present in lead work areas.

b. Hands shall be washed immediately at end of shift and before eating, drinking, using tobacco, or applying cosmetics.

c. No protective clothing shall be taken from the work site.

9.10 SIGNS

9.10.1 Warning signs shall will be posted in each work area where lead abatement is being conducted and when the likelihood that personnel will be exposed to lead levels above the action level.

9.10.2 Signs shall comply with the requirements of 29 CFR §1926.62 or 29 CFR §1910.1025, as applicable.

9.11 DISPOSAL

9.11.1 Disposal of any lead-containing materials shall be in accordance with LPR 8500.1.

9.11.2 EMO representatives shall be contacted for assistance on proper disposal.

9.12 RECORDKEEPING

9.12.1 SFAB shall maintain the following records:

a. Completed LF 622s,

b. Air monitoring data,

c. Hazard Assessments, and

d. Bulk samples.

APPENDIX A. DEFINITIONS

Action Level. A measured airborne concentration of an air contaminant that is equal to one-half the occupational exposure limit for the contaminant, or other concentration where specified by OSHA substance-specific standard.

Certified Industrial Hygienist (CIH). One certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

Industrial Hygienist. A professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational health hazards.

Personal Protective Equipment (PPE). Specialized clothing or equipment worn or used by an individual for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts, or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

APPENDIX B. ACRONYMS

AL	Action Level
CIH	Certified Industrial Hygienist
CMOE	Center Maintenance and Operations Contractor
COD	Center Operations Directorate
FC	Facility Coordinator
FSH	Facility Safety Head
EMO	Environmental Management Office
HEPA	High-Efficiency Particulate Air
LaRC	Langley Research Center
LBP	Lead-Based Paint
LF	Langley Form
LPR	Langley Procedural Requirements
OCHMO	Office of the Chief Health and Medical Officer
OSHA	Occupational Safety and Health Administration
PHM	Potentially Hazardous Material
PPE	Personal Protective Equipment
SFAB	Safety and Facility Assurance Branch

Subject: Indoor Environmental Quality Program

Responsible Office: Safety & Mission Assurance Office

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Change History Log

Revision	Date	Description of Change
Baseline	March 24, 2021	New document

PREFACE

P.1 PURPOSE

a. This chapter establishes procedures and practices for the Indoor Environmental Quality (IEQ) Program at NASA Langley Research Center (LaRC).

b. The objective of the IEQ Program is to provide healthful indoor environments through proper facility design, operation, and maintenance. The program also provides a mechanism for resolving concerns about IEQ, including indoor air quality (IAQ) concerns.

P.2 APPLICABILITY

a. This Langley Procedural Requirement (LPR) is applicable to all LaRC organizations and all federal civil service personnel on Center.

b. This LPR is applicable to contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, agreements, or grants.

c. Noncompliance with the requirements of this LPR may result in appropriate disciplinary action against civil service personnel or sanctions against contractors in accordance with the terms of their contracts.

d. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term “shall.” The terms “may” denotes a discretionary privilege or permission, “can” denotes statements of possibility or capability, “should” denotes a good practice and is recommended, but not required, “will” denotes expected outcome, and “are/is” denotes descriptive material.

e. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

a. NPR 1800.1, NASA Occupational Health Program Procedures.

b. American Conference of Governmental Industrial Hygienists (ACGIH), TLVs® and BEIs® (latest annual edition).

P.4 APPLICABLE DOCUMENTS AND FORMS

a. LMS-CP-7151, Obtaining Waivers for Langley Management System (LMS) Requirements.

b. TED 01-00-015, OSHA Technical Manual.

c. American Conference of Governmental Industrial Hygienists (ACGIH), TLVs® and BEIs® (latest annual edition).

P.5 MEASUREMENTS/VERIFICATION

The Indoor Environmental Quality Program is audited by NASA's Office of the Chief Health and Medical Officer (OCHMO) during their triennial audit.

P.6 CANCELLATION

None

/s/ David F. Young March 24, 2021

Center Deputy Director Date

Distribution: Approved for public release via the Langley Management System; distribution is unlimited

CHAPTER 10: INDOOR ENVIRONMENTAL QUALITY PROGRAM

10.1 INTRODUCTION

10.1.1 Good Indoor Environmental Quality (IEQ) is important to ensure a healthy and productive work environment. IEQ is affected by a variety of factors, including building design, occupancy loading, and the work being performed. IEQ issues are commonly associated with nonindustrial, non-laboratory office buildings where typical office operations or building products (e.g., carpets, furniture, draperies), combined with improperly designed, used, or maintained heating, ventilation, and air conditioning (HVAC) and plumbing systems, may create an irritating or unhealthful environment.

10.1.2 The variety of work performed at NASA Langley Research Center (LaRC) poses special concerns for IEQ. Few buildings are dedicated office-only space. Instead, it is common to have office space co-located in buildings with research laboratories or shop areas. IEQ is also affected by routine, maintenance, and renovation activities in Center facilities.

10.1.3 Unusual odors may indicate a loss of contaminant control in laboratory or shop operations or poorly controlled construction and maintenance activities.

10.1.4 Complaints of unusual odors in the workplace is the most common IEQ issue on Center.

10.2 WAIVERS

10.2.1 Requests for waivers to any of the requirements in this LPR shall be processed in accordance with LMS-CP-7151, “Obtaining Waivers for Langley Management System (LMS) Requirements.”

10.3 RESPONSIBILITIES

10.3.1 The Safety and Facility Assurance Branch (SFAB) Lead Certified Industrial Hygienist (CIH) shall:

a. Serve as the focal point for receiving and investigating IEQ complaints at LaRC facilities.

b. Ensure IEQ investigations are conducted following appropriate guidelines (e.g., OSHA’s “Technical Manual” (TED 01-00-015)).

c. Provide technical guidance and support on minimizing the impact of construction, renovation, and maintenance activities on IEQ.

d. Oversee IEQ surveys and communication with affected personnel.

e. Ensure recommended corrective actions are appropriate to resolve IEQ problems.

f. Provide Facility Safety Heads, Facility Coordinators, supervisors, and personnel with information gained from investigations.

g. Advocate for funding of projects to correct high-priority problems.

10.3.2 The LaRC Occupational Health Clinic shall:

a. Provide medical evaluations of personnel experiencing IEQ-related symptoms.

b. Notify the SFAB CIH of the names of personnel and locations that may require environmental evaluation and assessment based on clinical findings of symptoms potentially related to poor IEQ.

10.3.3 Facility Safety Heads (FSH) and Facility Coordinators (FC) shall:

a. Assist the SFAB CIH in conducting IEQ investigations by providing pertinent information on building layout and activities and by providing access to required areas within the building.

b. Assure that corrective action is taken regarding routine maintenance or repairs as they pertain to IEQ.

c. Assist the SFAB CIH in distributing information to occupants in their facilities.

d. Notify the SFAB CIH when IEQ concerns are brought to their attention.

10.3.4 The Center Operations Directorate (COD) shall:

a. Design and implement construction and maintenance projects in a manner that minimizes their impact on IEQ.

b. Maintain building HVAC systems in good working order to reduce the potential for IEQ problems.

c. Ensure that roofs, windows, and other sources of possible moisture intrusion are maintained and repaired or replaced when moisture intrusion occurs.

d. Ensure that construction projects are managed and implemented in a manner that minimizes impact on local building occupants (e.g., minimize dust generation, noise, and chemical entrainment in buildings).

e. Maintain carpets and floors in accordance with best practice measures.

Note: Guidelines for carpet maintenance are provided by the Carpet and Rug Institute (CRI) with the exception that frequency of vacuuming may be in accordance with recommendations of the Restoration Industry Association (RIA).

f. Use cleaning products, detergents, and disinfectants that create minimal odors in custodial tasks.

g. Ensure janitorial contractors use high-efficiency particulate air (HEPA) filtered vacuum cleaners for vacuuming carpets.

h. Dry all wet carpets as soon as possible (i.e., within 24-48 hours) to reduce potential for mold growth.

i. Provide pest control services in accordance with the U.S. General Services Administration (GSA) Integrated Pest Management (IPM) guidance.

j. Consider the impact on IEQ in space management activities.

10.3.5 Supervisors shall:

a. Be familiar with the requirements of this chapter.

b. Support the IEQ Program as it relates to the needs of their personnel.

c. Support the SFAB CIH in identifying areas of concern.

d. Consider personnel sensitivities with respect to office housing decisions.

e. Coordinate decisions to temporarily relocate personnel having IEQ issues with the Langley Human Resources Office (HRO).

10.3.6 Personnel shall:

a. Notify the FSH or FC with IEQ concerns as soon as possible.

b. Support the SFAB CIH in identifying areas of concern and provide information on issues.

c. Maintain all house plants adequately so dead foliage does not accumulate. Plants should not be overwatered, as this may damage other materials and become a source for mold growth.

d. If possible, keep office doors open to allow for better cross ventilation.

e. Not obstruct supply air vents or return air grills. Blocking these units can cause the HVAC system to become unbalanced or can adversely affect ventilation. Furniture, boxes, or other materials stored near supply vents or return grills will affect airflow.

f. Comply with the LaRC smoking policy, as detailed in Chapter 2 of this LPR

g. Dispose of garbage promptly and properly.

h. Store food properly. Food attracts pests and when some foods are left unrefrigerated, they can spoil and generate unpleasant odors. Perishable foods should not be stored in desks or on shelves. Refrigerators should be cleaned on a regular basis to prevent odors. Kitchens and dining areas should be cleaned and sanitized to prevent pests. If food is spilled in microwave ovens, it should be cleaned up promptly.

i. Ensure custodial personnel have access to rooms so they can perform their duties per their contracts.

10.4 INVESTIGATIONS RELATED TO ODORS AND MOISTURE INTRUSION

10.4.1 The SFAB CIH shall determine the appropriate strategy for individual IEQ evaluations as well as the application of published regulations and guidelines. Hazard evaluations are made by a combination of communication with affected personnel, visual observations, and potential sampling, if warranted.

10.4.2 The evaluation of the degree of hazard associated with an indoor air quality concern will be based on comparison of existing conditions with applicable OSHA standards for personnel exposure to chemicals. SFAB shall report factors that adversely affect the comfort of occupants, such as inadequate air flow, temperature extremes, or poor lighting to the responsible supervisor to determine appropriate action, in the absence of any recognized hazard.

10.4.3 Whenever visible mold is detected in indoor environments, mitigation actions shall be recommended, without regard to species identification.

10.4.3.1 Interpretation of regulations and guidelines for chemical and biological exposures shall be made or supervised by the SFAB CIH. Based on guidance from the

American Industrial Hygiene Association, air sampling for airborne biological contaminants (e.g., mold) is generally not needed to effectively address moisture intrusion or mold growth.

10.5 THERMAL STRESS COMPLAINTS

10.5.1 The SFAB CIH shall evaluate complaints that the indoor air temperature is in a range that is uncomfortable and affects personnel productivity, but which will not result in thermal stress.

10.6 BUILDING-RELATED ILLNESS

10.6.1 A situation where a building occupant is suspected of having, or has been diagnosed by a physician as having, a specific building-related illness such as Legionnaire's disease, Pontiac fever, hypersensitivity pneumonitis, or building-related asthma shall be regarded as serious.

10.6.2 These situations shall be evaluated by the SFAB CIH and medical personnel from the LaRC Occupational Health Clinic.

10.7 RECORDKEEPING

10.7.1 SFAB shall maintain the following records:

a. Log of IEQ complaints, and

b. Copies of IEQ investigation reports.

APPENDIX A. DEFINITIONS

Certified Industrial Hygienist (CIH). One certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

Indoor Environmental Quality (IEQ). Refers to the air quality within and around buildings and structures, especially as it relates to the health and comfort of building occupants.

Industrial Hygienist. A professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational health hazards.

Threshold Limit Value (TLV®). Airborne concentration at or below which it is believed nearly all workers may be repeatedly exposed day after day with no adverse effect. Usually expressed in parts per million (ppm) for gases or vapors and milligrams per cubic meter (mg/m3) for dusts, fumes, and mists. Threshold Limit Values are specified by the American Conference of Governmental Industrial Hygienists (ACGIH) and several have been adopted for use by OSHA.

APPENDIX B. ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
BEI	Biological Exposure Indices
CIH	Certified Industrial Hygienist
COD	Center Operations Directorate
FC	Facility Coordinator
FSH	Facility Safety Head
GSA	U.S. General Services Administration
HEPA	High-Efficiency Particulate Air
HVAC	Heating, Ventilation, and Air Conditioning
HRO	Human Resources Office
IAQ	Indoor Air Quality
IEQ	Indoor Environmental Quality
IPM	Integrated Pest Management
LaRC	NASA Langley Research Center
LPR	Langley Procedural Requirements
OCHMO	Office of the Chief Health and Medical Officer
OSHA	Occupational Safety and Health Administration
SFAB	Safety and Facility Assurance Branch
TLV®	Threshold Limit Values

Subject: Industrial Hygiene Exposure Assessment and Management Program

Responsible Office: Safety & Mission Assurance Office

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Change History Log

Revision	Date	Description of Change
Baseline	March 24, 2021	New document

PREFACE

P.1 PURPOSE

a. This chapter establishes procedures to perform health exposure assessments and implement control measures for health hazards in the workplace. This includes performing personal and area air monitoring to evaluate the hazards posed by hazardous chemical agents. This chapter also covers proper documentation of these data and the control measures utilized to minimize personnel exposure.

P.2 APPLICABILITY

a. This Langley Procedural Requirement (LPR) is applicable to all NASA Langley Research Center (LaRC) organizations and all federal civil service personnel on Center.

b. This LPR is applicable to contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, agreements, or grants.

c. Noncompliance with the requirements of this LPR may result in appropriate disciplinary action against civil service personnel or sanctions against contractors in accordance with the terms of their contracts.

d. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term “shall.” The terms “may” denotes a discretionary privilege or permission, “can” denotes statements of possibility or capability, “should” denotes a good practice and is recommended, but not required, “will” denotes expected outcome, and “are/is” denotes descriptive material.

e. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

a. Toxic and Hazardous Substances, 29 CFR 1910 subpart Z.

b. NPR 1800.1, NASA Occupational Health Program Procedures.

c. LPR 1710.12, Potentially Hazardous Materials – Hazard Communication Standard.

d. American Conference of Governmental Industrial Hygienists (ACGIH), TLVs® and BEIs® (latest annual edition).

P.4 APPLICABLE DOCUMENTS

a. LMS-CP-7151, Obtaining Waivers for Langley Management System (LMS) Requirements.

b. LF 66, Worker Appointment and Certification Form.

c. American Conference of Governmental Industrial Hygienists (ACGIH), TLVs® and BEIs® (latest annual edition).

P.5 MEASUREMENTS/VERIFICATION

The Industrial Hygiene Exposure Assessment and Management Program is audited by NASA's Office of the Chief Health and Medical Officer (OCHMO) during their triennial audit.

P.6 CANCELLATION

None

/s/ David F. Young March 24, 2021

Center Deputy Director Date

Distribution: Approved for public release via the Langley Management System; distribution is unlimited.

CHAPTER 11: INDUSTRIAL HYGIENE EXPOSURE ASSESSMENT AND MANAGEMENT PROGRAM

11.1 INTRODUCTION

11.1.1 Personnel at NASA Langley Research Center (LaRC) may potentially be exposed to a variety of hazardous materials through the course of their daily activities.

11.1.2 Exposure assessments are a tool that can be utilized to identify the exposures and to make recommendations for the implementation for control measures if needed. Exposure assessments can be used to prioritize identified hazards, communicate those hazards to affected personnel, and identify the appropriate types of controls that should be in place to prevent or lessen the exposures.

11.2 WAIVERS

11.2.1 Requests for waivers to any of the requirements in this LPR shall be processed in accordance with LMS-CP-7151, “Obtaining Waivers for Langley Management System (LMS) Requirements.”

11.3 RESPONSIBILITIES

11.3.1 The Safety and Facility Assurance Branch (SFAB) Lead Certified Industrial Hygienist (CIH) shall:

a. Provide guidance on the requirements of federal, state, and local occupational health regulations.

b. Oversee the Industrial Hygiene Exposure Assessment and Management Program.

c. Ensure that Occupational Exposure Limits (OELs) are properly utilized.

d. Ensure that personnel and the environment are protected during operations that use hazardous chemicals and materials and that appropriate control measures are in place during these operations.

e. Ensure that only properly accredited personnel perform exposure assessments and recommend methods to control or minimize exposure.

f. Ensure that appropriate training is provided to personnel when needed.

g. Ensure that there is a program to maintain and calibrate sampling equipment utilized to perform exposure assessment.

h. Ensure that sampling operations are conducted appropriately, samples are analyzed by labs accredited by the American Industrial Hygiene Association (AIHA), and that findings are properly communicated to personnel, management, and the LaRC Occupational Health Clinic when applicable.

i. Ensure dermal (i.e., skin) exposures are evaluated properly.

j. Oversee the creation of similar exposure groups to effectively evaluate personnel exposures.

11.3.2 The LaRC Occupational Health Clinic shall:

a. Maintain a medical surveillance program for civil service and contractor personnel exposed to hazardous chemicals that require medical monitoring.

b. Maintain complete, accurate records of all medical examinations for personnel in the medical surveillance program.

(1) Records are to be retained for at least 30 years.

(2) Results of examinations are to be discussed with personnel as needed.

c. Identify examination elements following an exposure incident and assist with providing that information to other medical service providers.

d. Notify the SFAB Lead CIH when chemical exposure concerns are brought to their attention.

11.3.3 Facility Safety Heads (FSH) and Facility Coordinators (FC) shall:

a. Notify the SFAB Lead CIH when new activities in their facilities will involve hazardous materials where no exposure assessment or job hazard analysis has been performed.

b. Notify the SFAB Lead CIH hazard control measures (e.g., fume hoods, enclosures, local exhaust ventilation, and other engineering controls) are not operating properly.

c. Assist the SFAB Lead CIH by providing pertinent information on personnel, materials, operations, and equipment utilized during activities involving hazardous materials.

d. Provide access to required areas within the building during exposure assessments.

e. Assist the SFAB Lead CIH in distributing information to the building occupants.

f. Notify the SFAB Lead CIH when exposure concerns are brought to their attention.

11.3.4 The Center Operations Directorate (COD) shall:

a. Consult with the SFAB Lead CIH during the planning of any construction or maintenance activities that may involve hazardous chemicals or any proposed changes to facility infrastructure that could impact personal exposures (e.g., lab hoods, chemical storage rooms).

b. Ensure that bid specifications that may involve hazard control measures during renovation and maintenance activities are provided to SFAB for review and approval.

11.3.5 The Center Maintenance and Operations Contractor (CMOE) shall:

a. Consult with the SFAB Lead CIH prior to beginning any construction or maintenance activities that may create chemical odors, introduce biological hazards, create indoor air quality concerns, or potentially create building occupant exposure or discomfort.

b. Provide the SFAB Lead CIH results of any chemical exposure assessments and sampling collected by the CMOE safety staff.

11.3.6 Supervisors shall:

a. Contact the FSH or the SFAB Lead CIH for an exposure assessment whenever their personnel will be working with hazardous materials where there are no previous exposure assessments or job hazard analyses.

b. Contact the SFAB Lead CIH if their personnel report concerns of chemical exposure or other exposure to hazardous agents that may result in adverse health effects.

c. Ensure personnel are properly trained prior to handling potentially hazardous agents.

11.3.7 Personnel shall:

a. Properly use the engineering controls, work practice controls, and personal protective equipment (PPE) specified for any tasks where they work with hazardous materials.

b. Report any health concerns related to hazardous materials to their supervisors immediately.

11.4 EXPOSURE ASSESSMENT

11.4.1 Exposure assessments can be conducted using multiple methods, including representative air monitoring, estimation, or other modeling.

11.4.2 Based on standard practices, some routine activities, such as use of small quantities of low-hazard chemicals in enclosed systems, may not require additional evaluation. Making these determinations is referred to as a hazard assessment and is initiated and completed as part of the Job Hazards Analysis (JHA).

11.4.3 A more rigorous process is an exposure assessment, which involves a systematic evaluation of a work activity. These assessments are normally conducted under the direction of the SFAB Lead CIH.

11.4.4 Exposure Assessments may be qualitative or quantitative:

a. Qualitative baseline exposure assessments are often performed to determine whether a more in-depth quantitative exposure assessment is necessary.

b. Quantitative exposure assessments include air monitoring, noise dosimetry, and magnetic surveys. They are performed when it is impossible to determine whether a safe level of exposure may be maintained.

11.5 OCCUPATIONAL EXPOSURE LIMITS FOR HAZARDOUS AGENTS

11.5.1 NASA LaRC will comply with Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits as well as NASA’s health and safety requirements.

11.5.2 Consensus standards such as the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs®) will be used in order to achieve a higher level of personnel protection and risk reduction.

11.5.3 In certain instances, the SFAB Lead CIH may determine that the TLV® is not applicable based on review of the documentation for the TLV®.

11.5.4 Where no established OEL exists for a specific chemical, a working OEL may be established by the SFAB Lead CIH and used after thorough review of the data available for the chemical.

11.6 CONTROL OF HAZARDS

11.6.1 Whenever possible, hazards shall be eliminated.

a. Hazards that can be eliminated promptly and cost-effectively shall be performed quickly to eliminate potential exposure and the need for further evaluation.

b. When working on eliminating or controlling hazards, those knowledgeable about the work shall be involved either through consultation or direct participation.

c. The high-risk hazards shall be addressed first.

11.6.2 Where elimination is not feasible, engineering or administrative controls should be implemented.

11.6.3 When such controls do not completely eliminate the hazard or when they are not feasible, protective equipment shall be required.

11.6.4 Protective equipment may also be used when the task is infrequent or non-routine.

11.6.5 Controls shall also be prioritized such that the chemical or biological hazards presenting the greatest risk are managed first.

11.6.6 Short- and long-term control options shall be reviewed and included as part of the control strategy.

11.7 MEDICAL SURVEILLANCE

11.7.1 All personnel using chemicals covered under a Potentially Hazardous Material (PHM) Permit or operations covered under a Chemical Hygiene Plan (CHP) shall be placed under the appropriate medical surveillance program (e.g., Chemical Lab Worker) per Langley Form (LF) 66.

11.7.2 At the discretion of the SFAB Lead CIH, personnel using, handling, or otherwise exposed to hazardous chemicals not covered under a PHM permit or CHP may be required to:

a. Receive baseline and routine medical examinations.

b. Wear personal protective equipment.

11.7.3 LF 66 shall be submitted to the LaRC Occupational Health Clinic for personnel requiring medical surveillance due to risk of exposure.

11.8 TRAINING

11.8.1 All personnel using chemicals or performing operations that generate potential chemical exposure shall receive hazard communication training so they understand the information presented on a Safety Data Sheet (SDS) and know how to protect themselves from the hazards of the toxic material.

11.8.2 All personnel using highly hazardous chemicals or performing operations that generate potential chemical exposure shall have specific training for the particular chemical being used or handled.

11.8.3 The training shall cover the specific hazards of the material, requirements of the standard, and other information regarding controlling exposure.

11.9 CHEMICAL USAGE DURING CONSTRUCTION ACTIVITY

11.9.1 Adequate ventilation shall be provided for chemical usage on construction sites.

11.9.2 The FSH and FC shall be contacted prior to any operations where significant chemical odor will be created that may cause discomfort of the facility's occupants.

11.9.3 These operations shall be conducted on nights and weekends whenever feasible.

11.9.4 Safety Data Sheets for all chemicals being used shall be readily available to personnel.

11.9.5 PPE shall be required when using chemicals or performing operations that have the potential to generate chemical or biological exposures (e.g., cooling tower operations).

11.9.6 Each construction contractor or subcontractor shall be responsible for:

a. Assessing hazards,

b. Providing for exposure monitoring when warranted (e.g., silica, asbestos, and lead exposure),

c. Training their personnel,

d. Using engineering controls where feasible,

e. Providing proper PPE,

f. Providing medical surveillance when required,

g. Posting warning signs,

h. Erecting barricades, and

i. Implementing administrative controls.

11.10 RECORDKEEPING

11.10.1 PHM Permits shall be maintained by the Potentially Hazardous Materials Committee and SFAB.

11.10.2 Exposure assessments shall be maintained by SFAB.

11.10.3 Medical examination records shall be maintained by the LaRC Occupational Health Clinic.

APPENDIX A. DEFINITIONS

Certified Industrial Hygienist (CIH). One certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

Industrial Hygienist. A professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational health hazards.

Job Hazard Analysis (JHA). A technique that focuses on job tasks as a way to identify hazards and eliminate or reduce risk to an acceptable level.

Occupational Exposure Limit (OEL). The more stringent of:

a. The permissible exposure level (PEL) for the hazardous chemical as listed in 29 CFR Part 1910, Subpart Z; or

b. The Threshold Limit Value (TLV®) for the hazardous chemical assigned by the American Conference of Governmental Industrial Hygienists in the latest edition of "TLVs® and BEIs®"; or

c. Where there is no PEL, TLV®, or NASA standard for the chemical, an exposure level based on available published scientific information such as Safety Data Sheets.

Personal Protective Equipment (PPE). Specialized clothing or equipment worn or used by an individual for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts, or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

Threshold Limit Value (TLV®). Airborne concentration at or below which it is believed nearly all workers may be repeatedly exposed day after day with no adverse effect. Usually expressed in parts per million (ppm) for gases or vapors and milligrams per cubic meter (mg/m3) for dusts, fumes, and mists. Threshold Limit Values are specified by the American Conference of Governmental Industrial Hygienists (ACGIH) and several have been adopted for use by OSHA.

APPENDIX B. ACRONYMS

AIHA	American Industrial Hygiene Association
CHP	Chemical Hygiene Plan
CIH	Certified Industrial Hygienist
CMOE	Center Maintenance and Operations Contractor
COD	Center Operations Directorate
FC	Facility Coordinator
FSH	Facility Safety Head
JHA	Job Hazards Analysis
LaRC	NASA Langley Research Center
LF	Langley Form
LPR	Langley Procedural Requirements
OCHMO	Office of the Chief Health and Medical Officer
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration
PHM	Potentially Hazardous Materials
PPE	Personal Protective Equipment
SDS	Safety Data Sheet
SFAB	Safety and Facility Assurance Branch
TLV®	Threshold Limit Value

Subject: Critical Incident Stress Management (CISM) Program

Responsible Office: Safety & Mission Assurance Office

TABLE OF CONTENTS

Change History Log

Revision	Date	Description of Change
Baseline	March 24, 2021	New document

PREFACE

P.1 PURPOSE

a. The purpose of the Critical Incident Stress Management (CISM) Program is to provide personnel at NASA Langley Research Center with support when there is an occurrence that causes a significant stress reaction that overwhelms their abilities to adjust emotionally.

P.2 APPLICABILITY

a. This Langley Procedural Requirement (LPR) is applicable to all NASA Langley Research Center (LaRC) organizations and all Federal civil service personnel on Center.

b. This LPR is applicable to contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, agreements, or grants.

c. Noncompliance with the requirements of this LPR may result in appropriate disciplinary action against civil service personnel or sanctions against contractors in accordance with the terms of their contracts.

d. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term “shall.” The terms “may” denotes a discretionary privilege or permission, “can” denotes statements of possibility or capability, “should” denotes a good practice and is recommended, but not required, “will” denotes expected outcome, and “are/is” denotes descriptive material.

e. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

a. NPR 1800.1, NASA Occupational Health Program Procedures.

P.4 APPLICABLE DOCUMENTS AND FORMS

a. NPR 1800.1, NASA Occupational Health Program Procedures.

b. LMS-CP-7151, Obtaining Waivers for Langley Management System (LMS) Requirements.

P.5 MEASUREMENTS/VERIFICATION

The Critical Incident Stress Management Program is audited by NASA’s Office of the Chief Health and Medical Officer (OCHMO) during their triennial audit and annually assessed by LaRC as part of the OCHMO Center Self Review.

P.6 CANCELLATION

LPR 1830.2C, dated October 19, 2017

/s/ David F. Young March 24, 2021

Center Deputy Director Date

Distribution: Approved for public release via the Langley Management System; distribution is unlimited.

CHAPTER 12: CRITICAL INCIDENT STRESS MANAGEMENT (CISM) PROGRAM

12.1 INTRODUCTION

12.1.1 This Langley Procedural Requirement (LPR) establishes a procedure for delivery of stress management services through a team coordinated by the Langley Research Center (LaRC) Occupational Health Officer (OHO), the LaRC Medical Director, and LaRC Occupational Health Clinic Administrator and outlines the responsibilities related to the Critical Incident Stress Management (CISM) Program.

12.1.2 The CISM Program describes the procedures to be followed in providing CISM services immediately following an emergency situation, delegates specific responsibilities, outlines preparatory measures to be taken in advance, provides for the psychological care and support of victims and their families, and specifies measures to assist with bringing about the orderly return of the workplace to a normal mode of operation.

12.1.3 Critical incidents that could occur at home or within the work place include, but are not limited to:

a. Suicides,

b. Assaults and threats,

c. Homicide in the workplace,

d. Situations attracting undue or critical media attention,

e. Serious workplace accidents,

f. Vehicle accidents,

g. Natural or man-made disasters,

h. Terrorism,

i. Major mission failure,

j. Domestic violence, and

k. Loss or death in the workplace.

12.2 WAIVERS

12.2.1 Requests for waivers to any of the requirements in this LPR shall be processed in accordance with LMS-CP-7151, “Obtaining Waivers for Langley Management System (LMS) Requirements.”

12.3 RESPONSIBILITIES

12.3.1 The CISM Program at LaRC shall:

a. Develop and coordinate the Center response plan.

b. Conduct and coordinate post-incident debriefing.

c. Conduct training.

d. Keep Center management informed of the CISM Program activities.

e. Mobilize support services both within the Center and in the community at large, assessing the Center's response to crises, and adjusting the response as warranted.

f. Be flexible, available, accessible, and timely.

12.3.2 The Employee Assistance Program (EAP) provider shall:

a. Develop CISM procedures.

b. Train and maintain a Critical Incident Stress Debriefing (CISD) Team.

c. Provide direction and coordination of the CISD Team.

d. Ensure proper assessment, triage, treatment, referral, and follow up for personnel adversely affected by a critical incident for up to one year post-incident.

e. Provide promotion and education about the CISM Program to Center management, supervisors, and personnel.

f. Maintain a list of resources for referral.

g. Provide 24-hour support throughout the incident and aftercare.

h. Prepare a general, after-action report on critical incident services for review by the LaRC Medical Director and LaRC Occupational Health Clinic Administrator.

12.3.3 The LaRC Medical Director or LaRC Occupational Health Clinic Administrator shall provide the finalized after-action report to the CISM Team for review at the next CISM Team meeting of lessons learned and process improvement.

12.3.4 Critical Incident Stress Management (CISM) Team

12.3.4.1 The CISM Team shall include the following:

a. LaRC Medical Director or designee;

b. LaRC Occupational Health Officer;

c. LaRC Occupational Health Clinic Administrator;

d. Employee/Labor Relations Representative;

e. Office of Chief Counsel legal advisor;

f. EAP mental health professionals;

g. Center Operations Directorate, Protective Services Office Emergency Manager and Chief of Protective Services; and

h. Managers or supervisors as appropriate for review of critical incidents and to help determine appropriate members for the CISD Team.

12.3.4.2 The CISM Team shall:

a. Determine what services are needed, when the support will be provided, and how the services are to be delivered.

b. Review this LPR against NPR 1800.1 every two years to check for any required updates.

(1) If no changes are required, it shall be noted in the CISM Team meeting minutes.

c. Notify the EAP provider, by phone, of critical incidents; assist in identifying individuals and groups adversely affected by the event; and inform supervisors of availability of CISM services.

12.3.4.3 The Langley Occupational Health Clinic Administrator shall serve as CISM Team Lead.

12.3.4.4 CISM team members are expected to make a two-year commitment to the team once trained.

12.3.4.4.1 Mental health providers from the outside community shall also be included on the CISM Team as needed for support of non-NASA individuals.

12.3.5 Critical Incident Stress Debriefing Team

12.3.5.1 The EAP, in coordination with the CISM Team, determines needed CISD team members, who are expected to:

a. Respect confidentiality,

b. Have good interpersonal skills, and

c. React quickly when called.

12.3.5.2 CISD team members shall:

a. Maintain familiarization with CISD components.

b. Maintain intervention skills through participation in team building and planning meetings once initial training is completed.

c. Know and adhere to CISD procedures and protocols.

d. Provide CISM support following a critical incident whenever possible.

e. Take guidance and direction from the EAP.

12.3.6 Center managers and supervisors shall:

a. Notify the EAP provider, along with other designated contacts (e.g., Safety, Security, medical, personnel) of any critical incidents.

b. Assist in identification of individuals and groups adversely affected by a critical incident and provide incident information that will facilitate the debriefing process.

c. Encourage and grant time for personnel to participate in Center-sanctioned post-incident defusing and debriefings.

d. Notify the EAP provider of any difficulties personnel may be experiencing (e.g., changes in performance or behavior) following a critical incident.

12.3.7 The Langley Human Resources Office (HRO) is responsible for providing guidance and assistance with handling personnel problems.

12.3.8 The NASA Shared Services Center shall provide services to victims following an incident (e.g., insurance, death benefits, workers' compensation claims).

12.4 PRE-INCIDENT PREPARATION

12.4.1 Pre-incident training helps personnel prepare to cope with traumatic events and incidents. People who are forewarned about traumatic stress are better able to manage it and recognize its signs earlier.

12.4.2 Pre-incident training shall be designed to:

a. Teach effective approaches to dealing with traumatic stress;

b. Avoid ineffective approaches; and

c. Emphasize that it is normal to feel stress in abnormal situations.

12.4.3 Pre-incident training shall be included as part of new supervisor orientation and organizational briefings provided by the Langley Occupational Health Clinic Administrator at staff meetings, all-hands meetings, lunch/learns and other appropriate venues.

12.4.4 Trainings shall include best practices and procedures in dealing with critical incidents.

12.5 SMALL-SCALE INCIDENT INTERVENTIONS

12.5.1 Critical Incident Stress Defusing

12.5.1.1 EAP providers shall offer critical incident stress defusing in the form of one-on-one or small group discussions in the immediate post-event phase.

12.5.1.2 Personnel shall receive education about recognition of stress symptoms and management strategies for coping with stress. These techniques are used for limited-scope events or when only a small number of personnel are affected.

12.5.2 Critical Incident Stress Debriefing (CISD)

12.5.2.1 CISD team members shall:

a. Participate in initial assessments and post-incident intervention planning.

b. Provide defusing and debriefing services under the direction of the Langley Occupational Health Clinic Administrator and assist in identifying individuals in need of additional EAP services.

12.5.2.2 Upon completion of CISD services, those team members who provided the services shall be debriefed themselves by other team members.

12.5.2.3 CISD team members or the Langley Occupational Health Clinic Administrator shall assist in follow up monitoring of adversely affected personnel as requested or appropriate.

12.5.2.4 The LaRC Occupational Health Clinic Administrator shall provide guidance with all follow-up activities.

12.5.3 One-on-One Crisis Intervention/Counseling

12.5.3.1 Psychological support for personnel and family members shall be offered throughout the incident and aftercare.

12.5.3.2 Supervisors are responsible for encouraging and granting time for personnel to

participate in officially-sanctioned CISM services.

12.5.3.3 Supervisors should contact EAP directly if they are concerned that an individual is in need of additional assistance.

12.6 LARGE-SCALE INCIDENT INTERVENTIONS

12.6.1 EAP services shall be offered by NASA Langley management at the 24-hour EAP call center.

12.6.2 EAP call center personnel shall assist in contacting EAP providers who shall in turn assist local leadership in CISD activities.

12.6.3 Once notified of a critical incident, the Langley Occupational Health Clinic Administrator shall:

a. Assemble and notify the CISD Team and any appropriate community partners when there is a need for intervention/support.

b. Lead the CISD Team in providing defusing and debriefings and, as needed, provide one-on-one interventions, referral, and follow-up services.

12.7 RECORDKEEPING

12.7.1 Critical incident stress debriefings are considered confidential discussions under the EAP. All records shall be kept in compliance with NPR 1800.1, Paragraph 5.7.9.

12.7.2 Team members shall not make personal notes or records outside of required EAP records.

12.7.3 The EAP provider shall maintain an up-to-date list of trained CISD team members and their contact information.

12.7.4 The LaRC Occupational Health Clinic Administrator shall maintain minutes of the CISM Team meetings to maintain a record of collaboration among center offices in CISM process improvements and lessons learned.

APPENDIX A. DEFINITIONS

Critical Incident. The recognized definition of a critical incident is quite broad. A critical incident is defined as any event outside of the usual realm of daily human experience that is markedly distressing and has the potential to interfere with an individual's ability to function, either at the scene or at a later time.

Critical Incident Stress Debriefing. A structured group discussion, conducted soon after a traumatic event (i.e., 24 hours or less after an event), led by trained personnel intended to assist individuals who have experienced a critical incident. Its purpose is to mitigate the adverse psychological reaction resulting from a traumatic experience. The process supports recovery by providing group support and linking participants to counseling and treatment services if they become necessary.

Critical Incident Stress Defusing. A small group process that typically takes no more than 30 minutes. The purpose is to try to rapidly reduce the intense reaction to a traumatic event, "normalize" the experience so that personnel can return to routine duties as quickly as possible, provide information on acute stress and how to reduce it, and to determine if a full debriefing should be scheduled.

Critical Incident Stress Management. The constellation of services or activities that may be used by an organization to respond to and manage a critical incident. Services and activities include, but are not limited to, debriefings, outreach to the workforce, psycho-educational activities related to trauma, anniversary responses, etc.

APPENDIX B. ACRONYMS

CISD	Critical Incident Stress Debriefing
CISM	Critical Incident Stress Management
EAP	Employee Assistance Program
HRO	Human Resources Office
LaRC	NASA Langley Research Center
LPR	Langley Procedural Requirements
OCHMO	Office of the Chief Health and Medical Officer
OHO	Occupational Health Officer